

RTN 4-26179

**Former Barnstable County Fire Training
Academy Site**

Barnstable, MA

August 2023

**IMMEDIATE RESPONSE ACTION STATUS
REPORT & REMEDIAL MONITORING REPORT
NO. 65**



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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. 65 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) and perfluorooctanoic acid (PFOA), 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 January 2023 to June 2023. IRA Status and RMR Report No. 65 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 January - February 2023 and April 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. 65 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 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 approximately 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. The system utilizes a groundwater recovery well, PRW-4, located approximately 800 feet southeast of the FTA. The 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 HWSD. 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 Section 5.7 for the most recent (January and April 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 3 – 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 3.

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.

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 carbon changeout, 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 1600 feet and 1700 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 3**). 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 water in Mary Dunn Pond, it is 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.” From November 2019 to October 2020, BETA has conducted surface water and sediment sampling at Flintrock Pond. Potentially significant concentrations of the total summed of the five PFAS chemicals (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 concentrations are elevated 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 PFAS 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 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 0.44 ng/L (0.00044 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.

3.8 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.

3.9 PUBLIC INVOLVEMENT – PROJECT UPDATES

On April 13, 2023 and July 27, 2023 virtual public meetings were 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 operation including flow rate monitoring, twice weekly changes of the bag filters, checks of the transfer pumps and VFD, including carbon exchanges, regular backwashing of the carbon vessels, and minor repairs. 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 GWTS is conducted by well driller contractors in an attempt to maintain the groundwater pumping rate from 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 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://eeaonline.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 and PFHpA, 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-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

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 in presented in or 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.

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.

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 and 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 January to June 2023 reporting period, the primary treatment system (GWTS #1) and secondary system (GWTS #2) were in operation approximately 181 days. During the current reporting period, both treatment systems underwent a brief scheduled shutdown in order to allow pump out of accumulated iron sediment in let 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. The recovery well and both treatment systems did not incur any unscheduled shutdowns during this reporting period.

Between July and December 2022, 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 January 16, 2023, February 10, 2023, March 13, 2023, April 18, 2023, May 11, 2023, and June 6, 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 0.44 ng/L (0.00044 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:

- 700 ng/L - January 16, 2023
- 554 ng/L - February 10, 2023
- 684 ng/L - March 13, 2023
- 552 ng/L - April 18, 2023
- 470 ng/L - May 11, 2023
- 810 ng/L - June 6, 2023

The monthly totals are well above the GW-1 risk standards. During the January to April 2023 reporting periods, four of the six regulated PFAS compounds (PFOS, PFOA, 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 and PFNA were detected at concentrations below the MCP GW-1 standard. The May 2023 samples were analyzed at a dilution by the laboratory, which caused elevated minimum detection limits for the analysis. The resulting elevated detection limits for the analysis were 50 ng/L, which is above MCP GW-1 risk standards. PFOS and PFHxS were detected above the MCP GW-1, while PFOA, PFNA, PFHpA, and PFDA were detected below the laboratory detection/reporting limit of 50 ng/L. In the June 2023 Influent sample, three of the six regulated compounds (PFOS, PFNA, and PFHxS) were detected at concentrations exceeding the MCP GW-1 risk standard, the remaining 3 compounds were detected by the laboratory at levels below MCP GW-1 risk standards.

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, which is the groundwater extracted by well PRW-4. 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 500 to 700 ng/L.

Midpoint Data

In the January 2023 to June 2023 reporting periods PFOS, PFHxS, 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). The remaining compounds were below laboratory reporting limits.

The PFAS6 compounds were not detected above the laboratory reporting limits in the February, March, April, or May 2023 sampling rounds. No PFAS6 analytical concentrations in the January to June 2023 monthly Midpoint samples exceeded the MCP GW-1 risk standard (20 ng/L/0.020 µg/l). The sum of the PFAS6 compounds in the monthly Midpoint samples were:

- 16 ng/L - January 16, 2023
- BRL - February 10, 2023
- BRL - March 13, 2023
- BRL - April 18, 2023
- BRL - May 11, 2023
- 10 ng/L - June 6, 2023

Effluent Data

The PFAS6 compounds were not detected above the laboratory reporting limits for the January 2023 to June 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.

5.2.2 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 all of part of the 181 days in the reporting period. As part of operation and maintenance, the system was shut down in April 2023 for a short time on April 10, 2023 in order to have the sediment in the equalization tanks vacuumed out and disposed of by Clean Harbors. The system was restarted later that day. See section 5.6 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 column in gallons per minute (GPM). The average estimate instantaneous flow rate for GWTS #1 ranged from 5.4 GPM (June 2023) to 15.4 GPM (February 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.

Groundwater Volume Treated and Average Flow Rate

For the January 2023 to June 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 January 2023 to June 2023 ranged from approximately 0.20 million gallons (February 2023) to 0.68 million gallons (January 2023) with monthly average effluent flow rates that ranged from of 4.7 gpm to 15.2 gpm. The total gallons treated by GWTS #1 for the January to June 2023 reporting period was approximately 2.3 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. Both trends are most likely attributable to iron sludge build up in the recovery well and the force mains. BETA is currently in the process of scheduling a contractor to perform cleaning of the PRW-4 well pump and force mains.

Based on the approximate gallons treated and total influent concentrations of PFAS each month a total of approximately 5.7 grams of PFAS were estimated to have been removed from the groundwater by GWTS #1 during the January to June 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 January 16, 2023, February 10, 2023, March 13, 2023, April 18, 2023, May 11, 2023, and June 6, 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 for aqueous samples. 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 January 2023 monthly system sample PFOS was 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 February 2023 monthly sample, PFOS was detected at a concentration exceeding the MCP GW-1 risk standard, PFHxS, was detected at a concentration above the laboratory reporting limits but below MCP GW-1 standards, and the remaining compounds were below laboratory reporting limits. In the March 2023 sample, PFOS and PFHxS were detected at concentrations exceeding the MCP GW-1 standards, the remaining PFAS6 compounds were detected at concentrations above the laboratory reporting limits but below MCP GW-1 limits,. Analytical results from the April, May, and June sampling events were below laboratory reporting limits. The sum of the PFAS6 compounds in the January to June 2023 monthly Midpoint samples were:

- 5.7 ng/L - January 16, 2023
- 50 ng/L - February 10, 2023
- 164.8 ng/L - March 13, 2023
- BRL - April 18, 2023
- BRL - May 11, 2023
- BRL - June 6, 2023

The January, February, and March 2023 results may have been due to the lack of GWTT's ability to backwash the carbon vessels, due to lack of temporary tank storage space. As described below, in April 2023 the temporary tank storage space was pumped out (the wastewater was disposed off-site) and a large additional backwash settling/temporary storage tank was delivered to the Site and set up. This allowed GWTT to resume backwashing the carbon vessels of both systems. Results in April, May, and June were below laboratory reporting limits.

Effluent Data

The PFAS6 compounds were not detected in the Effluent samples at concentrations above the laboratory reporting limits in the January to June 2023 monthly samples . Refer to Table **1A** and the complete laboratory reports in **Appendix B** for the concentrations of the remaining unregulated PFAS compounds as well as the laboratory RDLs and MDLs.

5.3.2 GWTS #2 OPERATIONAL DETAILS

The attached **Table 2B** presents a monthly summary of the GWTS #2 performance data. As part of operation and maintenance, as mentioned below in section 5.6, the system was shut down in April 2023 for a short amount of time in order to have the sediments of equalization tanks vacuumed out and disposed of by Clean Harbors. The system was restarted later that day. See section 5.6 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 January to July 2023 reporting periods, the calculated Average Estimated Instantaneous Flow Rates for GWTS #2 ranged from approximately 4.7 gpm (June 2023) to 15.1 gpm (February 2023). As noted previously, 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.

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 2.3 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 2.4 gpm (June 2023) to 14.2 gpm (March 2023).

Similarly, to GWTS #1, the treatment volumes and flow rates for GTWS #2 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. Both trends are most likely attributable to iron sludge built up in the recovery well and the force mains which lead to the systems. BETA is currently in the process of scheduling a contractor to come and perform cleaning of the PRW-4 well pump and force mains.

Based on approximately 2.3 million gallons treated, approximately 5.3 grams of PFAS 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 January to June 2023 reporting period, treatment systems GWTS #1 and GWTS #2 were in operation for 181 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 4.66 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 500 to 800 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 SPENT FILTER BAG DISPOSAL

During operation of the two GWTS filter bags are changed out on a regular basis. After removal from the filter housing the spent filter bags are air dried and placed into drums. EQ Northeast, Inc. (EQ) was contracted by the County of Barnstable for disposal of the drums of the spent filter bags. On January 23, 2023, EQ picked up the 8 drums of spent filter bags and transported them off-site under a non-hazardous waste manifest to Wayne Disposal, Inc. Site #2 Landfill in Belleville Michigan. A copy of the manifest documentation is included in Appendix F.

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. The recovery well and force main cleaning was last performed in September 2022. 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 2022 BETA initiated the process for wastewater management/disposal that had been in use for several years. BETA submitted samples for pre-characterization to support proper disposal of wastewater and sediments. In September 2022, BETA submitted the Influent water to Global Cycle, who then submitted the sample to R.I Analytical Laboratories, Inc. of Warwick, RI for analysis of Total Suspended Solids (TSS). TSS analysis results were 4.7 mg/L. In October 2022, BETA collected volume-weighted, composite samples from the temporary storage tanks and submitted them to ESS Laboratory of Cranston, RI for analysis of volatile organic compounds (VOC), RCRA 8 Metals, Pesticides, Herbicides, Sulfides, and energy content (in British Thermal Units (BTUs)). Detectable concentrations of acetone and Total Metals were reported in the composite sample. PFAS concentrations in the wastewater were assumed to be equal to those documented in BETA's monthly Influent results submitted to Pace.

However, Global Cycle concluded that they could no longer accept and process the wastewater due to the PFAS content.

In early 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. On April 10, 2023, CHES, under BETA and GWTT oversight, utilized a vacuum truck to remove the wastewater and sediments from the interior and exterior tanks associated with the treatment system. Approximately 3,000 gallons of wastewater were removed from the property and transported to the CHES licensed disposal/management facility in Braintree, MA. A copy of the manifest documentation is included in Appendix F. According to the CHES proposal for the wastewater management, submitted to BETA and the County, the final, legal disposition of the wastewater was to be at the CHES Hazardous/nonhazardous waste incinerator in El Dorado, AR.

5.7 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

Groundwater monitoring activities related to the documented PFAS Release on Site have been ongoing since November 2013. BETA, formerly Nover-Armstrong Associates, was contracted by Barnstable County to provide LSP and environmental services in April 2018 and has conducted groundwater monitoring activities since June 2018.

In November 2018, BETA proposed a long-term monitoring sampling plan for Site-wide groundwater monitoring on a quarterly and annual basis. Following discussion, MassDEP approved of the sampling plan that included sampling of twelve (12) wells during three quarterly sampling events and sampling an additional eight (8) wells (total of twenty (20) during the annual sampling round. A copy of the plan can be found in previous IRA Status report submittals, including IRA Status Report and RMR No. 35 for the October 2019 reporting period. Additional monitoring points are added to either the quarterly or annual sampling round, as warranted to meet specific objectives or provide additional coverage.

BETA has conducted quarterly groundwater assessments since January 2019 under the approved program. The January 2019 event was selected as the original annual monitoring program for 2019 utilizing the selected 20 monitoring wells. However, it was decided later to move the annual monitoring round up to October 2019, and to add several wells to the sampling program. Since that time, the expanded annual list of monitoring wells has been sampled in October or November.

6.2 JANUARY 2023 AND APRIL 2023 QUARTERLY SAMPLING – GENERAL

BETA conducted quarterly groundwater monitoring events in January 2023 and April 2023 based on the MassDEP approved sampling plan. The January 2023 sampling round was conducted over two days,

January 31, 2023 and February 1, 2023. For simplicity, the groundwater monitoring results for wells sampled on February 1, 2023 are discussed as part of the January 2023 monitoring event.

A total of thirteen (13) monitoring wells were sampled during the January 2023 monitoring event. They included PFW-1, PFW-2, PFW-5, OW-8A, MW-12S, MW-22, PC-39, PC-1, PC-6A, PC-16D, PC-30, PC-28 and PC-34S. A total of twelve (12) monitoring wells were sampled during the April 2023 monitoring event. The list of wells was identical to the January 2023 round except PC-34S was not sampled in April 2023. 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 3** depict the sampling locations. The analytical results and trends of the data are discussed in section 6.3. 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. See Section 6.3.

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.

6.3 ANALYTICAL RESULTS

The PFAS analytical data for the January 2023 and April 2023 sampling rounds are summarized in **Table 3**. Copies of the laboratory reports/certificates of analysis for the January 2023 and April 2023 sampling events are 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** presents 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 reports 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. 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

Monitoring wells PFW-2 and PFW-1 are located within and immediately downgradient of the Hot Spot area on the southern portion of the FTA property. Groundwater from both monitoring wells continue to exhibit the highest PFAS6 concentrations detected throughout the Disposal Site.

PFW-2 is located adjacent to and downgradient of the Hot Spot area. Quarterly analytical results for PFW-2 identified a total PFAS6 concentration of 2,724 ng/L during the January 2023 sampling round and 3,033 ng/L in the April 2023 sampling round. Following the initial decrease in concentrations after the Hot Spot soil removal and subsequent Phase I Improvements, quarterly groundwater results have shown that PFAS6 concentrations have generally been increasing since October 2020.

Total PFAS6 concentrations at PFW-1, located approximately 120 feet east and downgradient of the Hot Spot area, significantly increased during the January 2023 (17,488 ng/L) and April 2023 (16,499 ng/L) rounds. This continues the current trend of steadily increasing PFAS6 concentrations in this area starting in November 2021 as shown on **Figure 6**. The large increase in PFAS6 concentrations is primarily driven by the increase in PFOS concentrations (15,000 ng/L in January 2023 and April 2023). The remainder of the individual PFAS6 compounds were detected at concentrations similar to historical results. The

Causes of the steadily increasing PFAS6 concentrations at PFW-1 are unknown. With the exception of the Phase I Improvements cap over the Hot Spot, the entire southern portion of the FTA was capped in September through November 2021, including the area surrounding PFW-1. One hypothesis under consideration 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. Evaluation of the groundwater trends in this area of the Site and potential causes is on-going.

OW-8A and PFW-5, located on the northeastern portion of the FTA property, continue to have total elevated PFAS6 concentrations above Method 1 GW-1 Risk Standards. OW-8A analytical results identified PFAS6 at concentrations of 3,118 ng/L in January 2023, a significant increase compared to the November 2022 quarterly sampling round. Of particular note, PFHxS increased to 2,000 ng/L compared to 70 ng/L in November 2022. In April 2023 PFAS6 concentrations decreased to 1,720 ng/L primarily due to the lower PFHxS concentration (660 ng/L). As shown on **Figure 7**, PFAS6 concentrations in OW-8 had remained relatively consistent through February 2022, followed by sudden increases and wide variations in PFAS 6 concentrations. Causes of the varying and/or increasing PFAS6 concentrations at OW-8 are unknown. The entire FTA was capped in September through November 2021, including the area surrounding and upgradient of OW-8. One hypothesis under consideration is that the increased PFAS6 concentrations post-capping may be a result of varying volumes of treated groundwater being discharged upgradient of OW-8 causing periodic mounding of groundwater resulting in increased contact with typically unsaturated soil entrained with PFAS from former FTA training operations.

PFW-5 analytical results identified PFAS6 at 1,862 ng/L in January 2023 and 1,600 ng/L in April 2023. Both the January 2023 and April 2023 PFAS6 concentrations decreased compared to the November 2022 sampling round and are generally consistent with historical results.

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. MW-12S

analytical results identified PFAS6 concentrations of 1,957 ng/L in January 2023 and 1,265 ng/L in April 2023. As shown on Figure 8, this continues the recent trends of decreasing PFAS6 at this location since 2022, during which PFAS 6 concentrations had risen. Groundwater at MW-22S, approximately 225 feet northeast of MW-12S and 450 east of the FTA, exhibits PFAS6 concentrations that are significantly lower than percent of those at MW-12S. PFAS6 concentrations at MW-22 during the January 2023 and April 2023 sampling rounds were 67 ng/L and 118 ng/L, respectively. With the exception of the July 2022 concentration spike, PFAS6 concentrations at MW-22 over the past year have been stabilizing at levels lower than historical results.

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

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 PFAS6 concentrations of 264 ng/L in January 2023 and 1,487 ng/L in April 2023. The January 2023 PFAS6 concentrations are significantly lower and inconsistent with historical results. PFAS6 concentrations in April 2023 returned to typical levels. With the exception of the November 2022 analytical results, PFAS6 concentrations at PC-1 have typically been lower than those observed prior to and immediately following the construction of asphalt cap at the FTA in October 2021.

Figure 9A depicts the concentrations trends observed in groundwater at PC-6A located approximately 750 feet southeast of the FTA and most likely cross-gradient of recovery well PRW-4. The recent analytical results identified PFAS6 concentrations of 849 ng/L in January 2023 and 572 ng/L in April 2023. Similar to the July and November 2022 sampling events, the recent results continue the recent downward trend of PFAS6 concentrations at PC-6A. However, the overall PFAS 6 results at PC-6A have varied over a significant range since May 2020. It should be noted that the months of January and April 2023 were relatively dry (in terms of precipitation) with lower groundwater depths. Historically, the higher PFAS6 concentrations were observed during the typically wetter / higher groundwater months of the year.

Figure 9B depicts the concentrations trends observed in groundwater at PC-11 located approximately 700 feet southeast of the FTA and upgradient and approximately 125 feet up-gradient of recovery well PRW-4. Although PC-11 was not included in the January or April 2023 rounds of sampling the analytical results the previous groundwater analyses are depicted in Figure 9B, tabulated on Table 3, and discussed herein due to the location of this monitoring point. Previous sampling events identified PFAS6 concentrations of 2,105 ng/L in April 2022 and 3,354 ng/L in November 2022. These results continue the trend of significantly lower PFAS6 concentrations since October 2020, with PFAS 6 concentrations at PC-11 varying over a significant range since January 2021.

Downgradient Areas South and Southeast of the FTA

PC 34S, located approximately 200 feet south of the FTA and directly east of Flintrock Pond, revealed a PFAS6 concentration of 2,161 ng/L during the January 2023 sampling round. The January 2023 PFAS6 concentration is the highest concentration detected over six sampling rounds since 2016. PFAS6 concentrations at PC-34S continue the trend of steadily increasing concentrations starting in April 2022. The cause(s) of the increasing concentrations are unknown. Prior to April 2022, PFAS6 concentrations were similar to the July 2022 and November 2022 sampling rounds. Shallow soil analytical results from

Transect A (in the general direction of PC-34S) only identify PFAS compounds above Method 1 S-1/GW-1 Risk Standards up to 50 feet from the FTA property line (SS-104 0-3"). Additionally, the 2022 surface water analytical results from Flintrock Pond identify significantly lower PFAS6 concentrations than detected at PC-34S. The PFAS6 concentrations historically and currently detected at PC-34S may indicate that one flow vector of the PFAS plume migrating from the FTA is due south and only minor contributions to PFAS 6 concentrations in groundwater in this area are from Flintrock Pond. However, complex interactions may be occurring between the PFAS-contaminated sediment in the pond and underlying groundwater.

PC-39 was sampled during both the January 2023 and April 2023 quarterly sampling rounds. It is located approximately 430 feet south, southeast of the FTA property line and to the north of 180 Airport Way. Analytical results identified PFAS6 at 193 ng/L in January 2023 and 105.2 ng/L in April 2023 comprising mostly PFOS with minor contributions of PFHxS. The relatively low concentrations of PFAS6 compared to other monitoring wells east of the FTA such as PC-1 and PC-6A were previously interpreted as PC-39 being located near the southwestern edge of PFAS plume originating from the FTA. However, recent Phase II CSA results may indicate that the current and historic PFAS 6 concentrations at PC-39 may be more indicative of conditions only in the shallow groundwater, with higher PFAS concentrations deeper in the aquifer. These results will be reported in the Interim Phase II CSA Status Report.

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. Quarterly analytical results identified PFAS6 concentrations of 418 ng/L in January 2023 and 2,100 ng/L in April 2023. The January 2023 PFAS6 concentration is significantly lower than historical sampling rounds beginning in July 2022. From July 2021 to January 2022, PFAS6 concentrations were relatively stable between 326 ng/L (January 2022) and 594 ng/L (July 2021). However, the overall trend of PFAS6 concentrations has significantly increased starting in July 2022 and has remained consistent with the April 2023 results, other than exception noted above.

Groundwater concentrations at PC-28 are depicted on **Figure 9C**; PC-28 is located greater than 500 feet east, southeast and downgradient of recovery well PRW-4. Starting in October 2020, PFAS6 concentrations significantly increased and have remained elevated but varying. PFAS6 concentrations during this time have ranged between 749 ng/L to 1,547 ng/L other than the markedly lower concentration detected in the July 2021 sampling round. The recent 2023 analytical results continue this trend with PFAS6 detected at 1,547 ng/L in January 2023 and 805 ng/L in April 2023.

Figure 9D depicts PFAS6 concentration trends in monitoring well PC-30, located approximately 170 feet east - southeast and downgradient of recovery well PRW-4. As shown on Figure 9D, since February 2020, historical PFAS6 concentrations at PC-30 have exhibited an overall decreasing trend; however, PFAS6 concentrations increased to 1,435 ng/L in January 2023. The January 2023 results are a significant spike compared to the November 2022 results (497 ng/L). Later in April 2023, PFAS6 concentrations decreased to 831 ng/L.

BETA will evaluate recovery well improvements and the installation of additional recovery wells as part of the planned IRA groundwater recovery and treatment expansion and Phase III Remedial Action Plan activities.

Conclusions

Based on a review of the analytical results compiled in Table 3 for the January 2023 and April 2023 sampling events, the following general conclusions regarding the PFAS6 groundwater plume can be made:

- The highest concentrations within the PFAS contaminant plume are in the southeast corner of the FTA (at PFW-1) southeast and in close proximity to the FTA. The causes of the PFAS6 concentration trends at this location are unknown but may be related to the Hot Spot area conditions.
- High PFAS6 concentrations have also been detected to the south and in close proximity to the FTA and Flintrock Pond, as indicated by the PC-34S results.
- Elevated PFAS6 concentrations continue to be detected east and southeast (downgradient) of the recovery well PRW-4. Groundwater analytical results have shown an overall increasing trend of PFAS6 concentrations compared to the July 2022 and November 2022 sampling rounds.
- PFAS6 concentrations to the east of the FTA and along the northern extent of the plume (MW-22) PFAS6 concentrations over the past year have been stabilizing at levels lower than historical results with the exception of the July 2022 concentration spike.

6.4 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 the February 10, 2023 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 on April 18, 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 is being procured. 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 February 10, 2023 data indicate a general continuation of the historic patterns. The results of gauging from selected dates will be depicted in an updated groundwater contour map to be presented in the Interim Phase II CSA Status Report No. 2.

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 have initiated the supplemental investigation, which is on-going. Results will be presented in the next IRA Status Report. If private wells are identified, a program of sampling may be proposed in coordination with MassDEP.

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. 65 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 PFAs 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)

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 PFAs 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)

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.

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	05/30/23	24827515	381776	8.8	1.17245	6/6/2023	Conducted system checks, changed bag filters, flushed sightglass, backwash carbon vessels	
TOTALS ⁶		181					2339811		5.72095			

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	05/30/23	15036400	103,788	2.4	0.31874	6/6/2023	Conducted system checks, changed bag filters, backwash carbon vessels	
TOTALS ⁶		181					2,325,150		5.39510			

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 Monitoring 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	HSW-6/HS-2(a)																	
SCREEN DEPTH (FEET)																				
WELL DIAMETER (INCHES)			2																	
WELL STATUS			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
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
PFAS (Method 537.1m or PACE SOP 454)																				
PFOs	70	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
PFOA	70	20	--	--	--	660	--	320	160	15	94	79	80	48	320	180	45	550	170	160
PFNA	NE	20	--	--	--	--	--	--	--	BRL (<87)	26	46	40	52	35	47	57	65	46	150
PFHxS	NE	20	--	--	--	--	--	--	--	26	140	310	350	71	1,400	440	100	2,500	410	350
PFHpA	NE	20	--	--	--	--	--	--	--	15	66	100	69	56	640	150	49	870	160	200
PFDA	NE	20	--	--	--	--	--	--	--	--	--	30	18	23	21	19	13	12	7	19
TOTAL 16 PFAS	70	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

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 PFM-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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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	HSW-1/HS-1(a)												
SCREEN DEPTH (FEET)															
WELL DIAMETER (INCHES)			2												
WELL STATUS			Viable												
SAMPLING DATE			1/23/2016	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
PFAS (Method 537.1m or PACE SOP 454)															
PFO5	70	20	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	70	20	--	--	1,000	350	1,300	320	840	100	64	46	36	100	470
PFNA	NE	20	--	--	--	--	--	--	43	65	43	33	22	57	46
PFHx5	NE	20	--	--	--	--	--	--	1,700	300	170	150	66	300	1,600
PFHpA	NE	20	--	--	--	--	--	--	510	67	52	43	32	63	430
PFDA	NE	20	--	--	--	--	--	--	--	55	19	13	9.1	37	12
TOTAL 16 PFAS	70	20	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. Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFO5, 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, PFO5, PFOA, PFNA, PFHx5, and PFHpA, effective June 11, 2018.

2. The USEPA and MassDEP ORS Guideline applies to five PFAS chemicals of concern (PFO5, PFOA, PFNA, PFHpA, and PFHx5) individually as well as the sum of the five PFAS of concern.

3. The complete PFAS concentration data set collected from PRM-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, PFHx5, 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 (PFO5, PFOA, PFNA, PFHx5, 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. PFO5 - Perfluorooctanesulfonate

9. PFOA - Perfluorooctanoic Acid

10. PFNA - Perfluorononanoic Acid

11. PFHx5 - 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-excavation activities.

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

17. NE- Not Established

18. Due to labeling error MW-3S was labeled as MW-3 on the laboratory report and CDC in the November 2021.

Table 3 - Summary of Long Term Monitoring 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	PFW-1																										
SCREEN DEPTH (FEET)																													
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	
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)	ng/L	ng/L																											
PFOA	70	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	
PFOA	70	20	360	800	--	--	--	--	470	1,500	160	300	560	130	220	250	210	110	150	160	330	170	270	260	540	500	330	200	
PFNA	NE	20	--	--	--	--	--	--	--	3,900	330	360	210	570	230	94	110	80	94	66	50	69	120	74	99	170	210	150	
PFHxS	NE	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	
PFHpA	NE	20	--	--	--	--	--	--	--	610	140	290	500	150	200	220	160	82	200	250	440	190	390	350	660	330	370	160	
PFDA	NE	20	--	--	--	--	--	--	--	--	--	110	160	120	200	81	89	37	69	45	28	54	36	36	38	42	78	79	
TOTAL 16 PFAS	70	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	

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 PFW-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 15, 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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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	PFW-2																				
SCREEN DEPTH (FEET)																							
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
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 537.1m or PACE SOP 454)	ng/L	ng/L																					
PFO5	70	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
PFOA	70	20	5200	BRL(<800)	--	1,100	2,100	--	--	970	910	400	400	720	74	48	30	170	620	190	110	250	730
PFNA	NE	20	--	--	--	--	--	--	--	--	--	--	--	110	64	39	52	32	64	140	86	64	160
PFHx5	NE	20	--	--	--	--	--	--	--	--	--	--	--	1,800	230	140	71	650	940	470	310	620	1,000
PFHpA	NE	20	--	--	--	--	--	--	--	--	--	--	--	470	68	45	31	270	250	130	180	190	32
PFDA	NE	20	--	--	--	--	--	--	--	--	--	--	--	--	27	14	23	4	6.8	15.0	27	BRL (<20)	11
TOTAL 16 PFAS	70	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

Notes:

1. Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFO5, 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, PFO5, PFOA, PFNA, PFHx5, and PFHpA, effective June 11, 2018.

2. The USEPA and MassDEP ORS Guideline applies to five PFAS chemicals of concern (PFO5, PFOA, PFNA, PFHpA, and PFHx5) individually as well as the sum of the five PFAS of concern.

3. The complete PFAS concentration data set collected from PFW-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFO5/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, PFHx5, 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 15, 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 (PFO5, PFOA, PFNA, PFHx5, 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. PFO5 - Perfluorooctanesulfonate

9. PFOA - Perfluorooctanoic Acid

10. PFNA - Perfluorononanoic Acid

11. PFHx5 - 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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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 3	PFW-5																			
SCREEN DEPTH (FEET)																						
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
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	70	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
PFOA	70	20	250	170	64	150	120	26	88	120	100	120	84	120	180	89	150	73	14	24	110	110
PFNA	NE	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
PFHxS	NE	20	--	--	240	680	630	260	360	720	610	420	310	790	1,100	560	1,300	340	67	500	580	670
PFHpA	NE	20	--	--	30	82	54	22	56	66	44	60	80	110	160	76	240	45	9.2	20	48	100
PFDA	NE	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
TOTAL 16 PFAS	70	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

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 PFW-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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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	OW-8A																								
SCREEN DEPTH (FEET)																											
WELL DIAMETER (INCHES)			2																								
WELL STATUS			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		
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 537.1m or PACE SOP 454)																											
PFOs	70	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		
PFOA	70	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		
PFNA	NE	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		
PFHxS	NE	20	--	--	--	--	250	890	140	100	750	190	77	30	11	760	330	23	3,100	39	620	45	70	2,000	660		
PFHpA	NE	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		
PFDA	NE	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		
TOTAL 16 PFAS	70	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		

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 PFM-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOA/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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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	FS-15A		PFW-6					MW-3S						MW-21S	
SCREEN DEPTH (FEET)																	
WELL DIAMETER (INCHES)					2												
WELL STATUS			Viable		Destroyed					Viable						Destroyed	
SAMPLING DATE			6/16/2016	5/19/2021	4/1/2015	3/8/2016	4/18/2016	1/9/2019	10/10/2020	6/3/2014	8/18/2016	11/3/2021	4/21/2022	7/27/2022	11/9/202218	1/31/2023	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
PFAS (Method 537.1m or PACE SOP 454)																	
PFOS	70	20	1,700	12	3,400	2,400	850	1,500	810	4,900	1,900	1,400	1,300	1,600	4,200	830	1,100
PFOA	70	20	550	BRL (5.0)	350	470	19	400	70	530	690	360	330	470	890	220	310
PFNA	NE	20	--	BRL (<5.1)	--	--	--	140	63	--	--	36	64	68	110	24	31
PFHxS	NE	20	--	BRL (<4.4)	--	--	--	1,100	150	--	--	1,800	1,100	1,200	1,600	910	620
PFHpA	NE	20	--	BRL (<6.7)	--	--	--	220	170	--	--	210	160	190	530	81	110
PFDA	NE	20	--	BRL (<3.9)	--	--	--	--	3.9	--	--	BRL (<3.9)	7	10	8.3	BRL (<10)	11
TOTAL 16 PFAS	70	20	2,250	12	3,750	2,870	869	3,360	1,267	5,430	2,590	3,806	2,961	3,538	7,338	2,065	2182

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 PFW-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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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 3	MW-12i	MW-12S																			MW-13	
SCREEN DEPTH (FEET)																								
WELL DIAMETER (INCHES)																								
WELL STATUS			Viable	Viable																			Viable	
SAMPLING DATE			4/24/2017	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	7/29/2021	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
PFAS (Method 537.1m or PACE SOP 454)																								
PFOs	70	20	490	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	BRL(<0.020)	200
PFOA	70	20	36	400	470	280	650	920	250	380	580	280	220	280	230	46	150	100	170	350	190	150	BRL(<0.020)	17
PFNA	NE	20	--	--	--	56	64	92	87	80	78	86	51	51	28	6	27	27	18	17	21	14	BRL(<0.020)	4.5
PFHxS	NE	20	--	--	--	1,200	1,500	1,700	880	1,300	1,200	1,100	900	93	630	170	670	390	830	900	580	400	BRL(<0.020)	95
PFHpA	NE	20	--	--	--	130	490	440	170	310	390	140	120	110	74	14	73	63	75	100	66	71	BRL(<0.020)	30
PFDA	NE	20	--	--	--	--	--	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)	BRL (<0.020)	BRL (<1.9)
TOTAL 16 PFAS	70	20	526	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	0	346.5

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 PFM-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 15, 2019. MassDEP released drafted Method 1 groundwater risk standards for PFAS on April 15, 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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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-22																		MW-23		MW-201		
SCREEN DEPTH (FEET)																									
WELL DIAMETER (INCHES)																									
WELL STATUS			Viable																Viable		Viable				
SAMPLING DATE			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	10/21/2020	1/27/2021	5/20/2021	11/2/2021	1/25/2022	4/20/2022	7/28/2022	2/1/2023	4/5/2023	7/29/2021	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		
PFAS (Method 537.1m or PACE SOP 454)																									
PFOs	70	20	4,900	600	320	350	320	410	510	460	380	790	680	470	2,300	340	430	35	480	42	86	1,100	89	230	18
PFOA	70	20	530	90	30	140	160	190	150	230	120	92	160	250	150	83	94	3.3	77.0	BRL (<10)	7.1	76	120	14	BRL (<1.9)
PFNA	NE	20	--	--	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)	BRL (<20)	4.9	19	BRL (<1.9)
PFHxS	NE	20	--	--	130	680	600	520	690	540	330	360	740	800	570	220	280	18	370	25.0	23	260	180	84	15
PFHpA	NE	20	--	--	13	69	49	33	61	38	32	27	100	88	65	13	21	1	20	BRL (<10)	2	98	49	24	BRL (<1.9)
PFDA	NE	20	--	--	--	--	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 (<20)	BRL (<1.9)	BRL (<3.9)	BRL (<1.9)
TOTAL 16 PFAS	70	20	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	1,534	443	371	33

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 PFM-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOA/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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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-6A																				
SCREEN DEPTH (FEET)																							
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
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)																							
PFO5	70	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
PFOA	70	20	110	150	60	30	68	33	62	67	4.1	37	28	35	31	14	22	29	34	26	30	29	27
PFNA	NE	20	--	--	55	25	60	36	48	65	3.8	44	44	58	45	23	32	41	72	42	47	58	45
PFHxS	NE	20	--	--	300	190	310	150	290	180	23	99	71	83	72	49	59	62	83	62	72	72	65
PFHpA	NE	20	--	--	75	37	83	45	86	71	9	43	37	43	42	24	32	39	40	33	47	37	36
PFDA	NE	20					10	BRL (<4.1)	7.4	5.9	0.7	11	12	12	11	3.9	10	10	16	11	12	13	9
TOTAL 16 PFAS	70	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

Notes:

1. Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFO5, 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, PFO5, PFOA, PFNA, PFHx5, and PFHpA, effective June 11, 2018.

2. The USEPA and MassDEP ORS Guideline applies to five PFAS chemicals of concern (PFO5, PFOA, PFNA, PFHpA, and PFHx5) individually as well as the sum of the five PFAS of concern.

3. The complete PFAS concentration data set collected from PFM-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFO5/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, PFHx5, 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 (PFO5, PFOA, PFNA, PFHx5, 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. PFO5 - Perfluorooctanesulfonate

9. PFOA - Perfluorooctanoic Acid

10. PFNA - Perfluorononanoic Acid

11. PFHx5 - 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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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-11																			PC-14					
SCREEN DEPTH (FEET)																											
WELL DIAMETER (INCHES)																											
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	8/20/2014	3/30/2016	4/28/2017	11/2/2021	11/11/2022
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	
PFAS (Method 537.1m or PACE SOP 454)																											
PFOs	70	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	550	2,100	1,600	700	700
PFOA	70	20	550	430	250	180	250	410	640	BRL (<240)	150	290	140	130	150	78	59	74	58	40	70	120	40	250	160	26	76
PFNA	NE	20	--	--	--	--	230	190	1,700	540	320	140	130	110	100	74	69	61	78	63	88	82	--	--	--	37	69
PFHxS	NE	20	--	--	--	--	1,500	1,500	2,400	1,200	800	1,300	720	610	640	250	170	320	270	160	240	620	--	--	--	92	160
PFHpA	NE	20	--	--	--	--	200	310	210	BRL (<210)	160	210	140	130	160	92	65	75	88	60	87	210	--	--	--	43	62
PFDA	NE	20	--	--	--	--	--	--	450	BRL (<260)	73	69	56	55	52	69	32	31	21	18	20	22	--	--	--	BRL (<3.9)	7.3
TOTAL 16 PFAS	70	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	590	2,350	1,760	898	1,074

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 PFM-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 15, 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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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-16d																					
SCREEN DEPTH (FEET)																								
WELL DIAMETER (INCHES)																								
WELL STATUS			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
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)																								
PFO5	70	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
PFOA	70	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
PFNA	NE	20	--	--	--	100	BRL (<8.7)	110	36	79	110	63	49	62	48	83	23	8.9	26	45	70	59	18	72
PFHx5	NE	20	--	--	--	670	60	520	270	220	360	170	260	280	110	16	72	49	55	160	680	360	75	490
PFHpA	NE	20	--	--	--	170	13	140	74	80	92	61	68	63	54	47	15	9	25	42	88	71	19	110
PFDA	NE	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
TOTAL 16 PFAS	70	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

Notes:

1. Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFO5, 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, PFO5, PFOA, PFNA, PFHx5, and PFHpA, effective June 11, 2018.

2. The USEPA and MassDEP ORS Guideline applies to five PFAS chemicals of concern (PFO5, PFOA, PFNA, PFHpA, and PFHx5) individually as well as the sum of the five PFAS of concern.

3. The complete PFAS concentration data set collected from PFM-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFO5/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, PFHx5, 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 15, 2019. MassDEP released drafted Method 1 groundwater risk standards for PFAS on April 15, 2019 that applies to the total sum, and individual concentrations of six PFAS compounds (PFO5, PFOA, PFNA, PFHx5, 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. PFO5 - Perfluorooctanesulfonate

9. PFOA - Perfluorooctanoic Acid

10. PFNA - Perfluorononanoic Acid

11. PFHx5 - 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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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-17			PC-18								
SCREEN DEPTH (FEET)														
WELL DIAMETER (INCHES)														
WELL STATUS			Viable			Viable								
SAMPLING DATE			8/20/2014	10/7/2015	2/6/2018	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
PFAS (Method 537.1m or PACE SOP 454)														
PFOs	70	20	140	230	140	1,200	900	580	890	1,500	1,500	330	290	140
PFOA	70	20	BRL	24	17	110	590	--	70	110	75	18	6.3	8.2
PFNA	NE	20	--	--	--	--	--	--	--	130	79	20	10	12
PFHxS	NE	20	--	--	--	--	--	--	--	540	220	57	59	32
PFHpA	NE	20	--	--	--	--	--	--	--	140	80	21	20	18
PFDA	NE	20	--	--	--	--	--	--	--	--	7.2	6.8	BRL (<3.9)	2.2
TOTAL 16 PFAS	70	20	140	254	157	1310	1490	580	960	2420	1,961	453	385	212

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 PRM-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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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-28																			
SCREEN DEPTH (FEET)																						
WELL DIAMETER (INCHES)																						
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
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		
PFAS (Method 537.1m or PACE SOP 454)																						
PFO5	70	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
PFOA	70	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
PFNA	NE	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
PFHx5	NE	20	--	--	17	15	30	94	72	120	71	230	170	110	120	85	83	95	75	130	120	76
PFHpA	NE	20	--	--	20	24	25	33	23	41	30	89	66	45	53	43	51	47	40	75	66	44
PFDA	NE	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
TOTAL 16 PFAS	70	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

Notes:

1. Prior to June 11, 2018, the USEPA established the EPA Health Advisory for two PFAS chemicals, PFOA and PFO5, 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, PFO5, PFOA, PFNA, PFHx5, and PFHpA, effective June 11, 2018.

2. The USEPA and MassDEP ORS Guideline applies to five PFAS chemicals of concern (PFO5, PFOA, PFNA, PFHpA, and PFHx5) individually as well as the sum of the five PFAS of concern.

3. The complete PFAS concentration data set collected from PFM-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFO5/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, PFHx5, 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 15, 2019. MassDEP released drafted Method 1 groundwater risk standards for PFAS on April 15, 2019 that applies to the total sum, and individual concentrations of six PFAS compounds (PFO5, PFOA, PFNA, PFHx5, 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. PFO5 - Perfluorooctanesulfonate

9. PFOA - Perfluorooctanoic Acid

10. PFNA - Perfluorononanoic Acid

11. PFHx5 - 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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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-30																						
SCREEN DEPTH (FEET)																									
WELL DIAMETER (INCHES)																									
WELL STATUS			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	
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	70	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	
PFOA	70	20	88	--	98	99	85	85	79	55	130	45	38	32	48	26	21	30	25	23	16	21	45	35	
PFNA	NE	20	--	--	--	80	88	100	100	61	74	45	57	40	24	40	BRL (<5.1)	51	34	23	19	43	110	65	
PFHxS	NE	20	--	--	--	510	390	340	300	220	210	180	120	100	76	64	68	96	72	63	43	59	110	96	
PFHpA	NE	20	--	--	--	130	110	110	96	71	87	80	48	47	47	40	34	43	35	33	25	29	54	45	
PFDA	NE	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	
TOTAL 16 PFAS	70	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	

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 PRM-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 15, 2019. MassDEP released drafted Method 1 groundwater risk standards for PFAS on April 15, 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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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-345						PC-365						PC-38											
SCREEN DEPTH (FEET)																										
WELL DIAMETER (INCHES)																										
WELL STATUS			Viable						Viable						Viable											
SAMPLING DATE			4/14/2016	11/2/2021	4/21/2022	7/27/2022	11/9/2022	1/31/2023	4/14/2016	1/11/2019	10/29/2019	10/22/2020	11/3/2021	11/10/2022	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	
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 537.1m or PACE SOP 454)																										
PFOs	70	20	1,300	1,300	580	710	1,300	1,500	35	64	1,200	700	640	760	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	
PFOA	70	20	72	74	65	69	80	94	BRL (<5.3)	BRL (<3.3)	54	36	32	37	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 (<5.0)	BRL (<2.0)	
PFNA	NE	20	--	150	100	130	140	230	--	BRL (<8.7)	80	57	71	120	--	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)	
PFHxS	NE	20	--	160	140	140	130	210	--	38	120	79	73	90	--	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)	
PFHpA	NE	20	--	87	77	74	98	110	--	BRL (<7.4)	62	42	38	49	--	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)	
PFDA	NE	20	--	7.8	7.2	8.6	16	17	--	--	11	11	11	13	--	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)	
TOTAL 16 PFAS	70	20	1372	1,779	969	1,132	1,764	2,161	35	102	1,527	925	865	1,069	BRL	6.1	6.7	BRL	BRL	4.3	BRL	BRL	BRL	BRL	5.5	

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 PFM-4 is detailed in the data table titled "Summary of Groundwater Pump and Treatment System PFOA/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 15, 2019. MassDEP released drafted Method 1 groundwater risk standards for PFAS on April 15, 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-excavation activities.

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

17. NE- Not Established

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

Table 3 - Summary of Long Term Monitoring 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 3	PC-39							PC-29	HW-1016					
SCREEN DEPTH (FEET)																
WELL DIAMETER (INCHES)																
WELL STATUS			Viable							Viable	Viable					
SAMPLING DATE			4/24/2017	2/19/2020	11/2/2021	7/28/2022	11/10/2022	2/1/2023	4/4/2023	11/10/2022	5/3/2017	1/10/2019	10/28/2019	10/21/2020	11/3/2021	11/11/2022
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
PFAS (Method 537.1m or PACE SOP 454)																
PFOs	70	20	1,200	820	140	180	160	180	96	2.4	25	BRL (<6)	BRL (<5.2)	BRL (<5.7)	BRL (<5.7)	17
PFOA	70	20	46	28	BRL (<5.0)	BRL (<5.0)	2.2	BRL (<10)	BRL (<4.1)	BRL (<1.8)	8	BRL (<3.3)	BRL (<7.4)	BRL (<5.0)	BRL (<5.0)	BRL (<1.9)
PFNA	NE	20	--	61	6.9	6.0	5.2	BRL (<10)	BRL (<4.1)	BRL (<1.8)	--	BRL (<8.7)	BRL (<4.9)	BRL (<5.1)	BRL (<5.1)	BRL (<1.9)
PFHxS	NE	20	--	100	4.9	12.0	12	13	9.2	3.6	--	BRL (<5.6)	BRL (<5.2)	BRL (<4.4)	BRL (<4.4)	37
PFHpA	NE	20	--	28	BRL (<6.7)	BRL (<6.7)	4	BRL (<10)	BRL (<4.1)	BRL (<1.8)	--	BRL (<7.4)	BRL (<7.1)	BRL (<6.7)	BRL (<6.7)	BRL (<1.9)
PFDA	NE	20	--	BRL (<4.1)	BRL (<3.9)	BRL (<3.9)	BRL (<1.8)	BRL (<10)	BRL (<4.1)	BRL (<1.8)	--	--	BRL (<4.1)	BRL (<3.9)	BRL (<3.9)	BRL (<1.9)
TOTAL 16 PFAS	70	20	1,246	1037	151.8	198	183.4	193	105.2	6	33	BRL	BRL	BRL	BRL	54

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 PRM-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

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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-excavation activities.

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

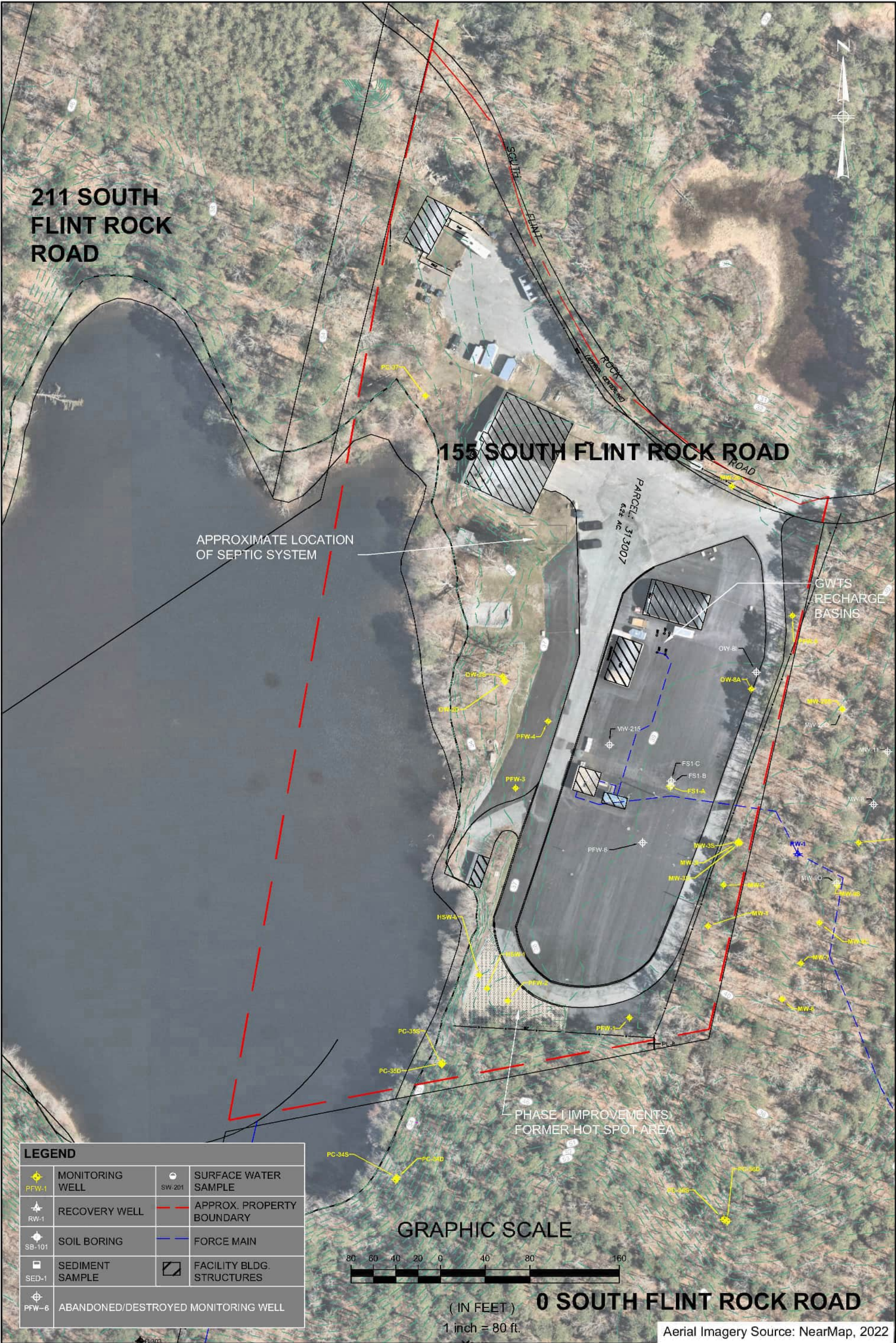
17. NE- Not Established

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

Table 4 - Groundwater Elevation and Gauging Date 2021-2023
Former Barnstable County Fire Training Academy Site
RTN 4-26179

Well ID	Location (From Academy)	Elev. (TOC) (Feet)	Depth to Groundwater from TOC (Feet)												Groundwater Elevation (Feet)											
			Date												Date											
			1/28/2021	5/19/2021	7/29/2021	11/1/2021	1/25/2022	4/21/2022	7/27/2022	10/25/2022	11/8/2022	2/10/2023	4/18/2023	1/28/2021	5/19/2021	7/29/2021	11/1/2021	1/25/2022	4/21/2022	7/27/2022	10/25/2022	11/8/2022	2/10/2023	4/18/2023		
FS-1sA	Academy	41.769	--	--	--	--	--	13.69	16.12	17.66	17.34	14.15	14.25	--	--	--	--	--	28.08	--	--	24.43	27.62	27.52		
HSW-1/HS-1(a)	Academy	40.012	13.31	13.04	14.73	13.94	13.13	11.56	13.95	15.5	15.33	12.07	--	26.70	26.97	25.28	26.07	26.88	28.45	26.06	24.51	24.68	27.94			
HSW-6/HS-2(a)	Academy	39.305	12.61	12.35	14.04	13.32	12.41	10.83	13.24	14.76	14.61	11.34	11.36	26.70	26.96	25.27	25.99	26.90	28.48	26.07	24.55	24.70	27.97	27.95		
OW-2D	Academy	37.36	10.78	10.60	12.34	11.34	10.90	9.21	11.74	13.07	12.85	10.65	9.68	26.58	26.76	25.02	26.02	26.46	28.15	25.62	24.29	24.51	26.71	27.68		
OW-2S	Academy	37.532	11.49	11.3	12.94	12	11.34	9.78	12.18	13.64	13.51	10.22	10.27	26.04	26.23	24.59	25.53	26.19	27.75	25.35	23.89	24.02	27.31	27.26		
OW-8A	Academy	42.471	16.19	15.94	17.6	16.62	15.92	14.43	--	18.35	18.11	14.98	15.3	26.28	26.53	24.87	25.85	26.55	28.04	--	24.12	24.36	27.49	27.17		
OW8-D		42.98	--	--	--	--	--	--	--	18.66	--	15.25	15.32	---	---	---	---	---	---	---	---	---	27.73	27.66		
PFW-1	Academy	41.83	15.54	15.19	16.87	15.95	15.25	13.69	15.09	17.66	17.51	14.2	14.32	26.29	26.64	24.96	25.88	26.58	28.14	26.74	24.17	24.32	27.63	27.51		
PFW-2	Academy	40.019	13.48	13.05	14.85	13.95	13.28	11.68	14.08	15.53	15.49	12.2	12.25	26.54	26.97	25.17	26.07	26.74	28.34	25.94	24.49	24.53	27.82	27.77		
PFW-3	Academy	37.832	11.14	10.92	12.60	11.64	11.00	-	11.87	13.37	13.15	9.94	9.99	26.69	26.91	25.23	26.19	26.83	--	25.96	24.46	24.68	27.89	27.84		
PFW-4	Academy	39.344	12.69	12.45	14.12	13.15	12.46	-	13.39	14.87	14.65	11.47	11.51	26.65	26.89	25.22	26.19	26.88	--	25.95	24.47	24.69	27.87	27.83		
PFW-5	Academy	42.017	15.38	15.11	16.82	15.8	15.11	13.63	--	17.51	17.32	--	14.23	26.64	26.91	25.20	26.22	26.91	28.39	--	24.51	24.70		27.79		
MW-1	Adjacent Academy	42.584	16.22	15.9	17.59	16.65	15.95	14.39	16.79	18.38	18.17	14.93	15.04	26.36	26.68	24.99	25.93	26.63	28.19	25.79	24.20	24.41	27.65	27.54		
MW-2	Adjacent Academy	42.72	16.56	16.25	17.92	17.05	16.3	14.72	17.13	18.72	18.49	--	--	26.16	26.47	24.80	25.67	26.42	28.00	25.59	24.00	24.23				
MW-3D	Adjacent Academy	43.654	16.91	16.55	--	--	--	--	--	--	18.82	15.63	15.71	26.74	27.10	--	--	--	--	--	--	24.83	28.02	27.94		
MW-3i	Adjacent Academy	43.823	16.84	--	--	--	--	--	--	18.97	18.75	15.53	15.62	26.98	--	--	--	--	--	--	--	25.07	28.29	28.20		
MW-3S	Adjacent Academy -SE	43.535	16.65	16.35	18.04	17.25	16.4	14.83	--	--	18.81	15.41	15.48	26.89	27.19	25.50	26.29	27.14	28.71	--	--	24.73	28.13	28.06		
MW-6	Adjacent Academy -SE	41.432	15.3	15.0	17.62	15.80	15	13.38	16.04	17.44	18.62	13.5	14.09	26.13	26.43	23.81	25.63	26.43	28.05	25.39	23.99	22.81	27.93	27.34		
MW-7	Adjacent Academy -SE	43.126	17.33	17.0	18.56	17.75	17	15.4	16.85	Dry > 18 ft	19.21	--	--	25.80	26.13	24.57	25.38	26.13	27.73	26.28	Dry > 18 ft	23.92	---	---		
MW-8C	Adjacent Academy -SE	43.992	17.96	17.6	18.2	18.4	17.65	16.06	18.51	Dry > 18 ft	18.62	16.66	16.7	26.03	26.39	25.79	25.59	26.34	27.93	25.48	Dry > 18 ft	25.37	27.33	27.29		
MW-9D (not viable)	Adjacent Academy -SE	45.079	--	--	--	--	-	-	19.38	--	--	18.49	17.61	--	--	--	--	--	--	25.70	--	---	26.59	27.47		
MW-9S	Adjacent Academy -SE	44.629	18.84	--	--	--	--	18.5	16.89	Rat nest	--	19.81	17.02	--	25.79	--	--	--	26.13	27.74	--	--	24.82	27.61	---	
MW-10	Adjacent Academy	44.212	dry	17.53	17.53	18.43	17.8	16.01	16.01	Dry > 18 ft	--	18.00	16.03	16.76	dry	26.68	26.68	25.78	26.41	28.20	Dry > 18 ft	--	26.21	28.18	27.45	
MW-12s	DG -E	43.421	17.94	17.6	dry	17.7	17.35	15.71	--	--	--	16.41	16.62	25.48	25.82	dry	25.72	26.07	27.71	--	--	---	27.01	26.80		
MW-22	DG-NE	43.46	18.23	17.22	dry	18.35	17.5	15.8	--	--	--	16.69	16.9	25.23	26.24	dry	25.11	25.96	27.66	--	--	---	26.77	26.56		
MW-28S	DG- NE	41.413	14.75	14.6	16.14	15.15	14.41	-	--	16.9	--	--	13.59	26.66	26.81	25.27	26.26	27.00	--	--	24.51	---	---	27.82		
MW-28D (abandoned)	DG- NE	NA	--	--	--	--	--	--	--	--	--	--	13.31	--	--	--	--	--	--	--	--	--	--	--		
MW-35i	DG- NE	52.265	--	--	--	28.9	--	--	--	--	32.14	27.39	--	--	--	--	23.37	--	--	--	--	20.13	24.88	--		
MW-35s	DG- NE	52.557	--	--	--	--	--	9.27	--	--	--	27.61	--	--	--	--	--	--	--	--	--	--	24.95	--		
MW-35D	DG- NE	52.481	--	--	--	--	--	9.65	--	--	--	--	27.02	27.94	--	--	--	--	--	--	--	--	25.46	24.54		
PC-1	DG-SE	54.57	--	29.45	31.23	30.25	29.8	27.8	--	--	31.89	28.42	28.69	--	25.12	23.34	24.32	24.77	26.77	--	--	22.68	26.15	25.88		
PC-6A	DG-SE	59.322	35.13	34.21	35.97	34.93	34.3	33.29	--	--	36.54	31.16	33.5	24.19	25.11	23.35	24.39	25.02	26.03	--	--	22.78	28.16	25.82		
PC-11	DG-SE	55.515	31.17	30.3	32.22	31.05	30.4	28.39	--	--	32.69	29.3	29.66	27.82	29.17	23.30	24.47	25.12	27.13	--	--	22.83	26.22	25.86		
PC-16D	DG-SE	56.276	33.46	32.39	34.31	33.01	32.01	29.96	--	--	34.64	31.27	31.71	22.82	23.89	21.97	23.27	24.27	26.32	--	--	21.64	25.01	24.57		
PC-18	DG-SE	55.342	--	--	--	32.03	-	-	-	--	33.65	--	--	--	--	--	23.31	--	--	--	--	21.69	---	---		
PC-28	DG-SE	40.895	18.98	17.99	19.49	18.4	17.65	15.45	--	--	19.71	16.85	17.11	21.92	22.91	21.41	22.50	23.25	25.45	--	--	21.19	24.05	23.79		
PC-29	DG-SE	42.169	--	--	--	--	--	-	-	--	20.7	--	--	--	--	--	--	--	--	--	--	21.47	--	--		
PC-30	DG-SE	57.484	34.14	32.12	34.9	33.71	33	30.9	--	--	35.29	32.06	32.4	23.34	25.36	22.58	23.77	24.48	26.58	--	--	22.19	25.42	25.08		
PC-34S	East of FRP ¹²	37.512	10.93	10.6	12.42	12.01	10.9	9.86	11.51	13.78	13.16	10.32	10.39	26.58	26.91	25.09	25.50	26.61	27.65	26.00	23.73	24.35	27.19	27.12		
PC-34D	East of FRP ¹²	38.278	11.64	11.32	12.97	11.4	10.9	-	12.23	13.06	12.91	9.6	9.87	26.64	26.96	25.31	26.88	27.38	--	26.05	25.22	25.37	28.68	28.41		
PC-35S	East of FRP ¹²	37.544	11.07	10.8	12.42	11.51	10.75	--	11.67	13.23																

FIGURES



K:\6206 BARNSTABLE COUNTY\MCP LSP BASE SERVICES\DRAWINGFILES\GW CONTOUR\6206_EX_BASE_AW2.DWG

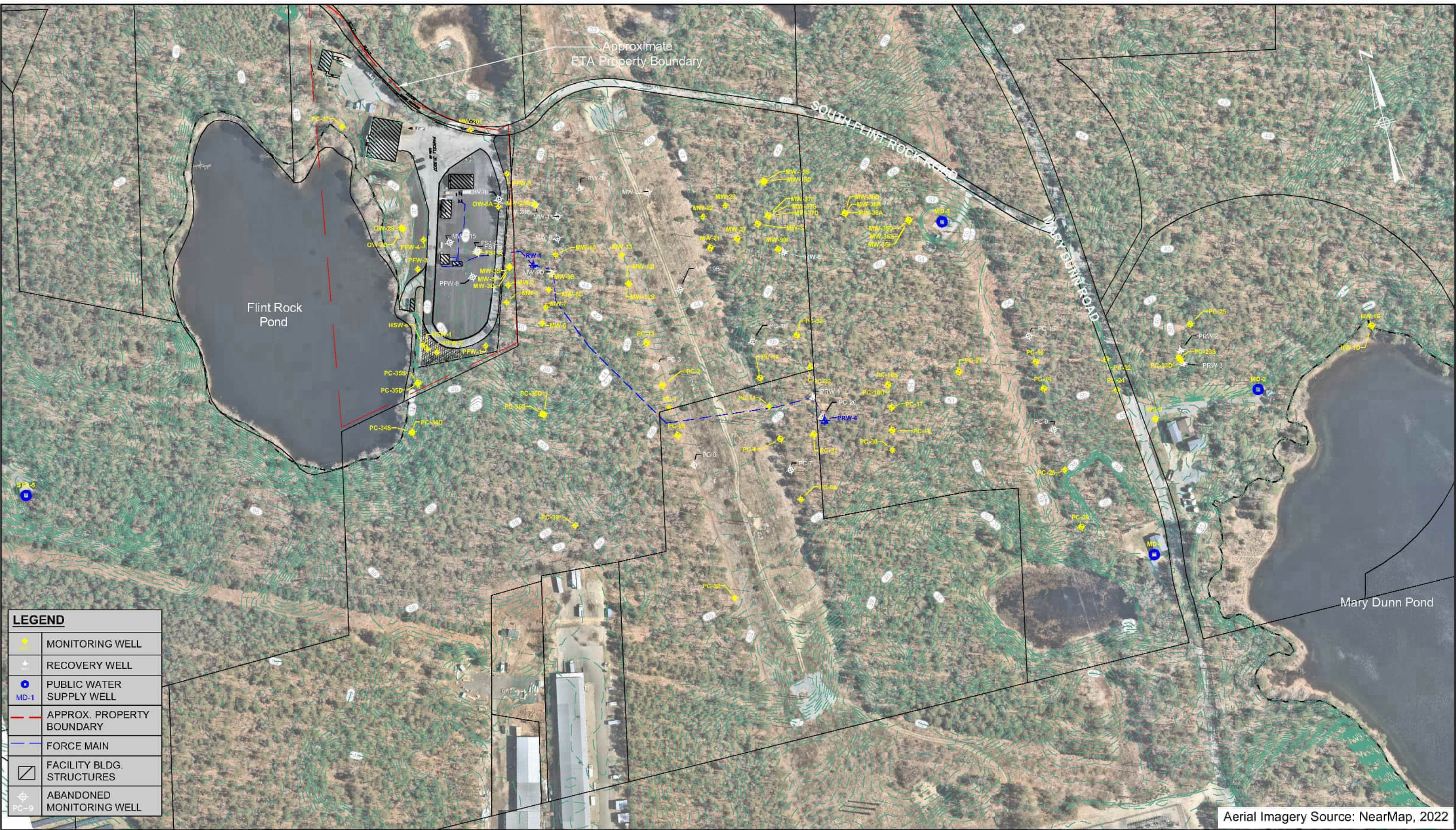
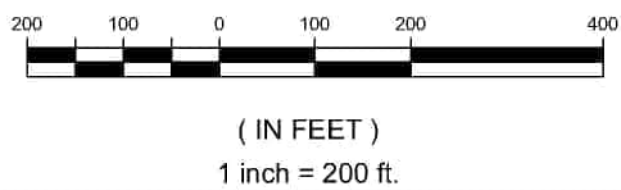


FIGURE 3 - SITE PLAN
Former Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA



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)

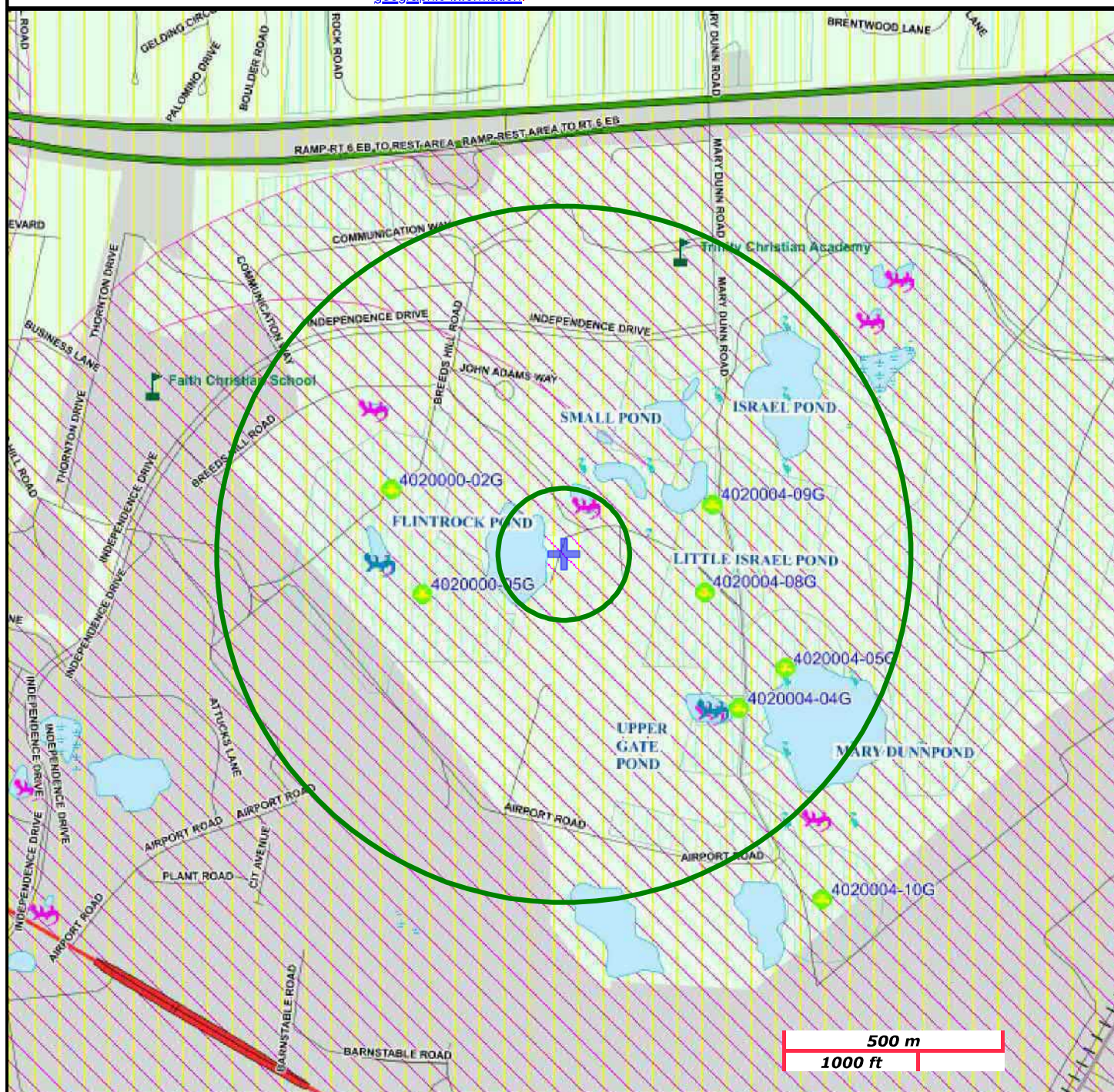
April 23, 2021

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

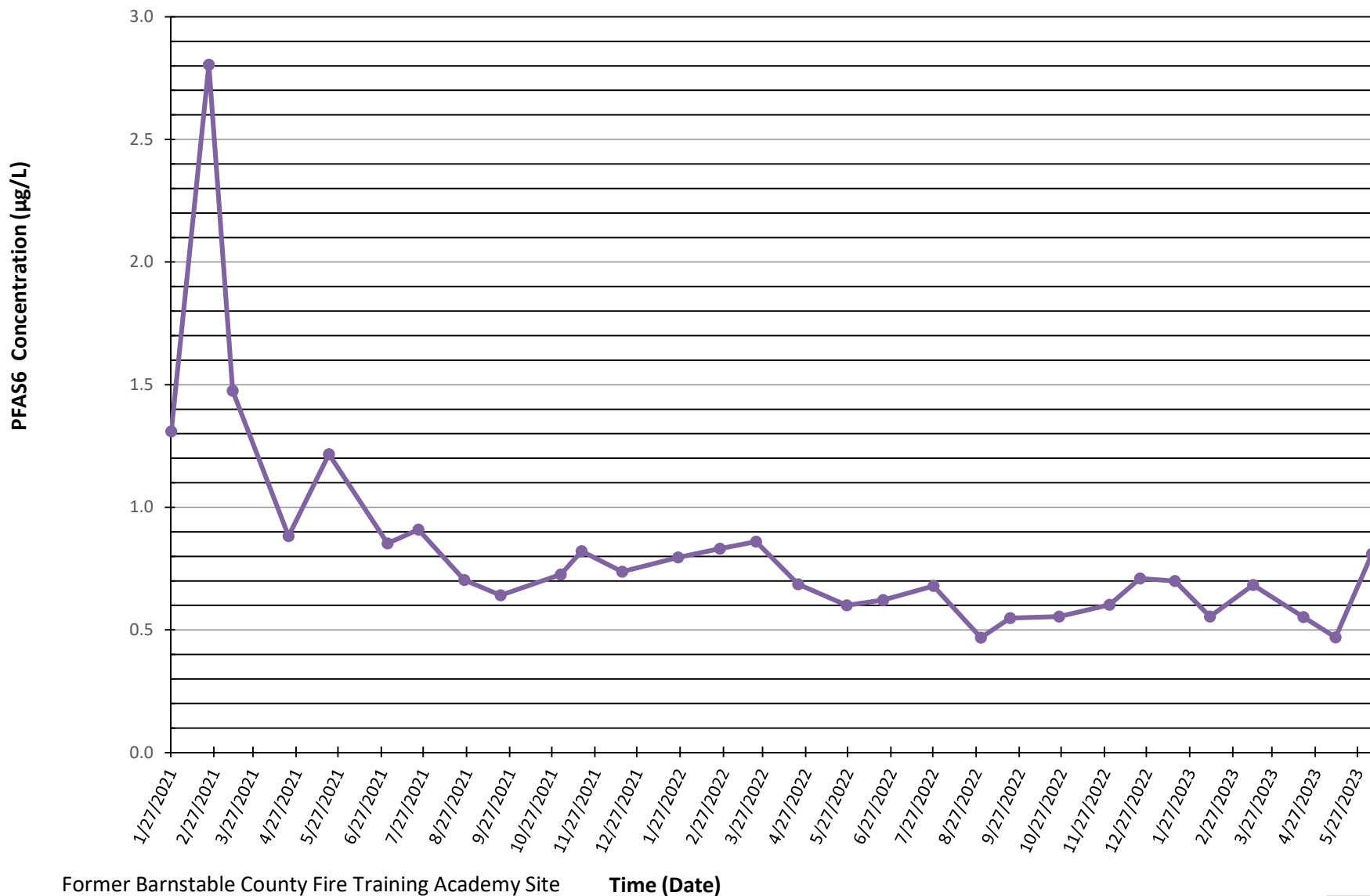
Wetlands: Freshwater, Saltwater, Cranberry Bog

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

RTN 4-26179

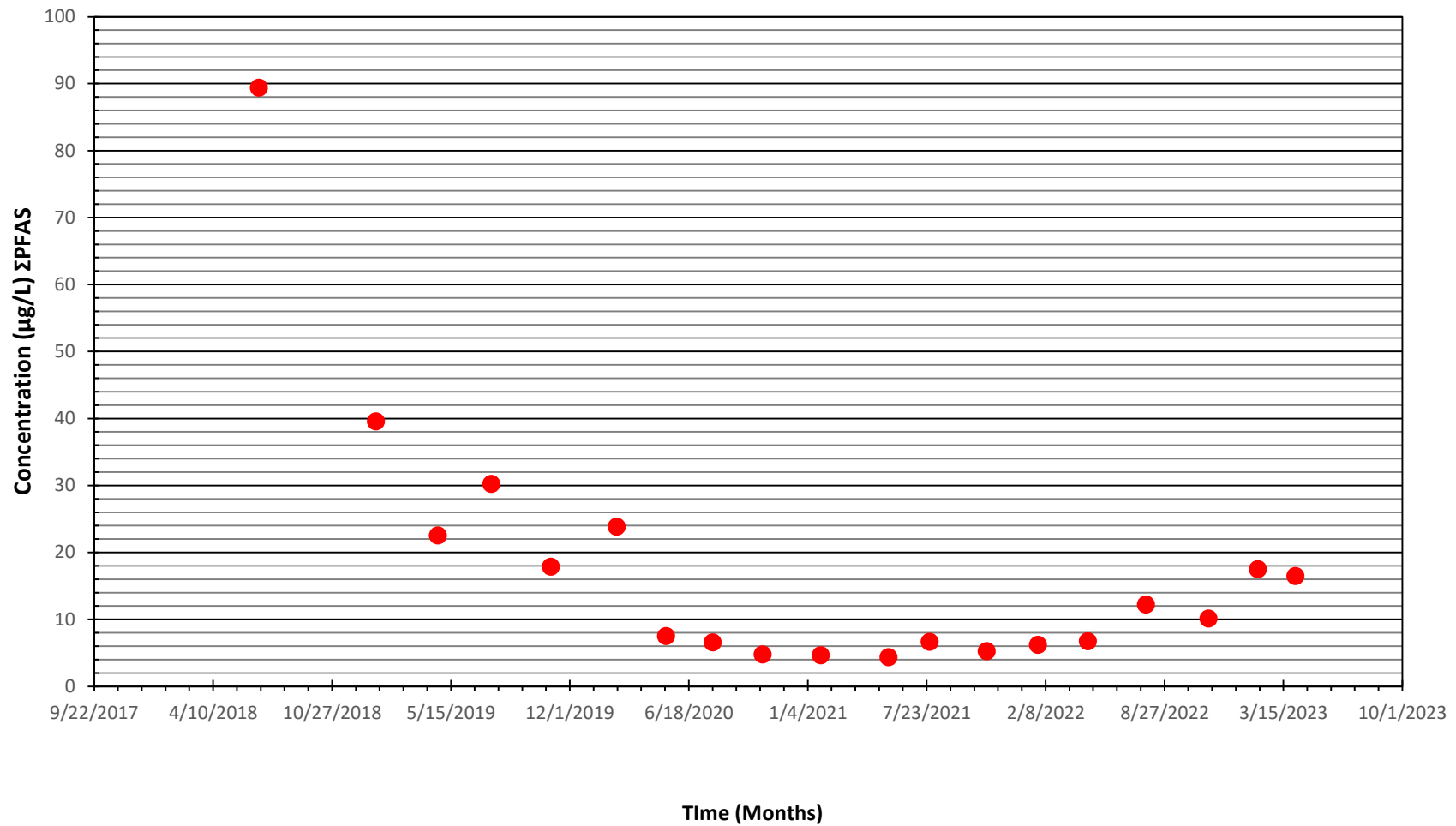
Time (Date)

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 - April 2023



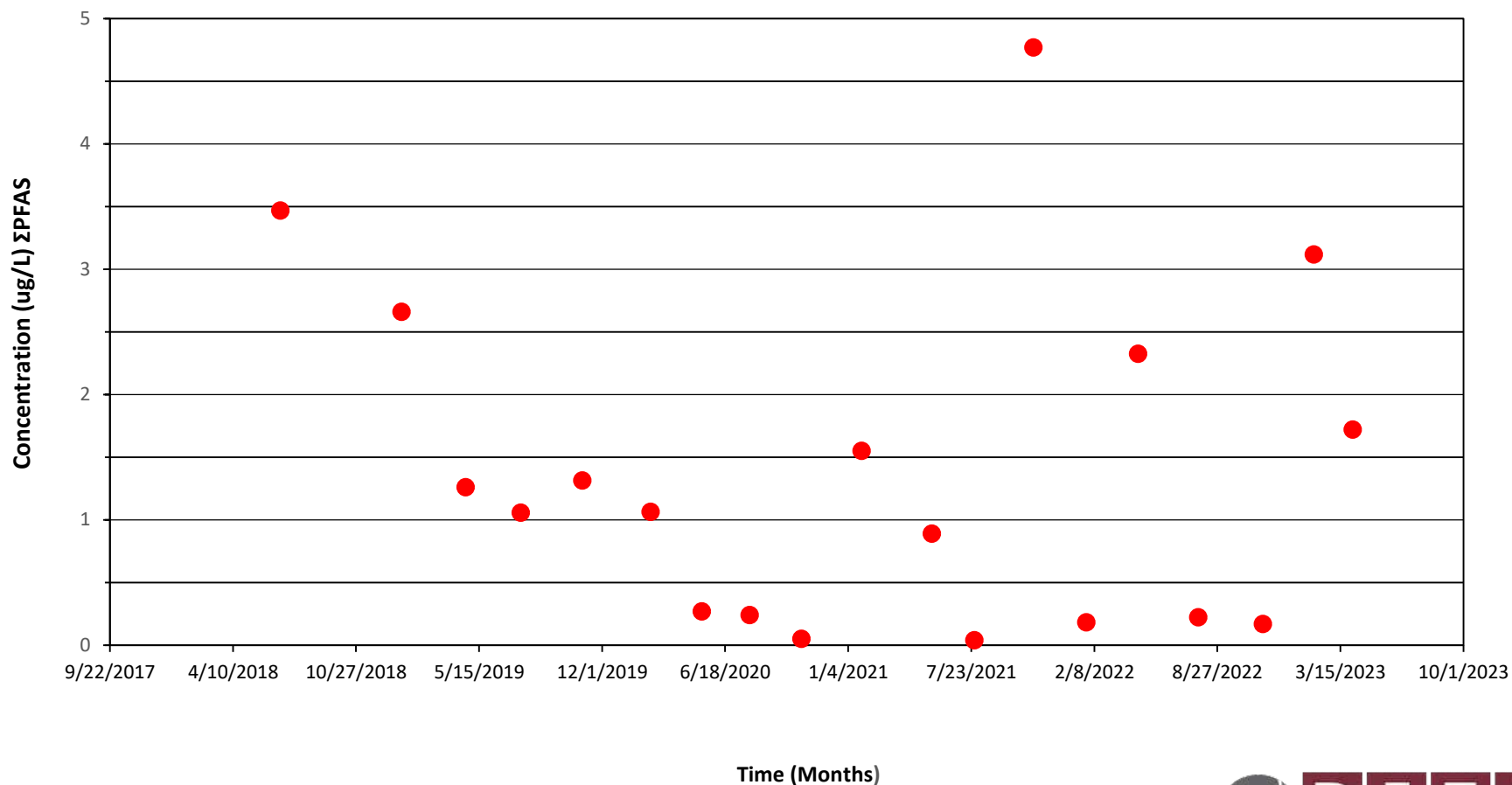
Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA
RTN 4-26179



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



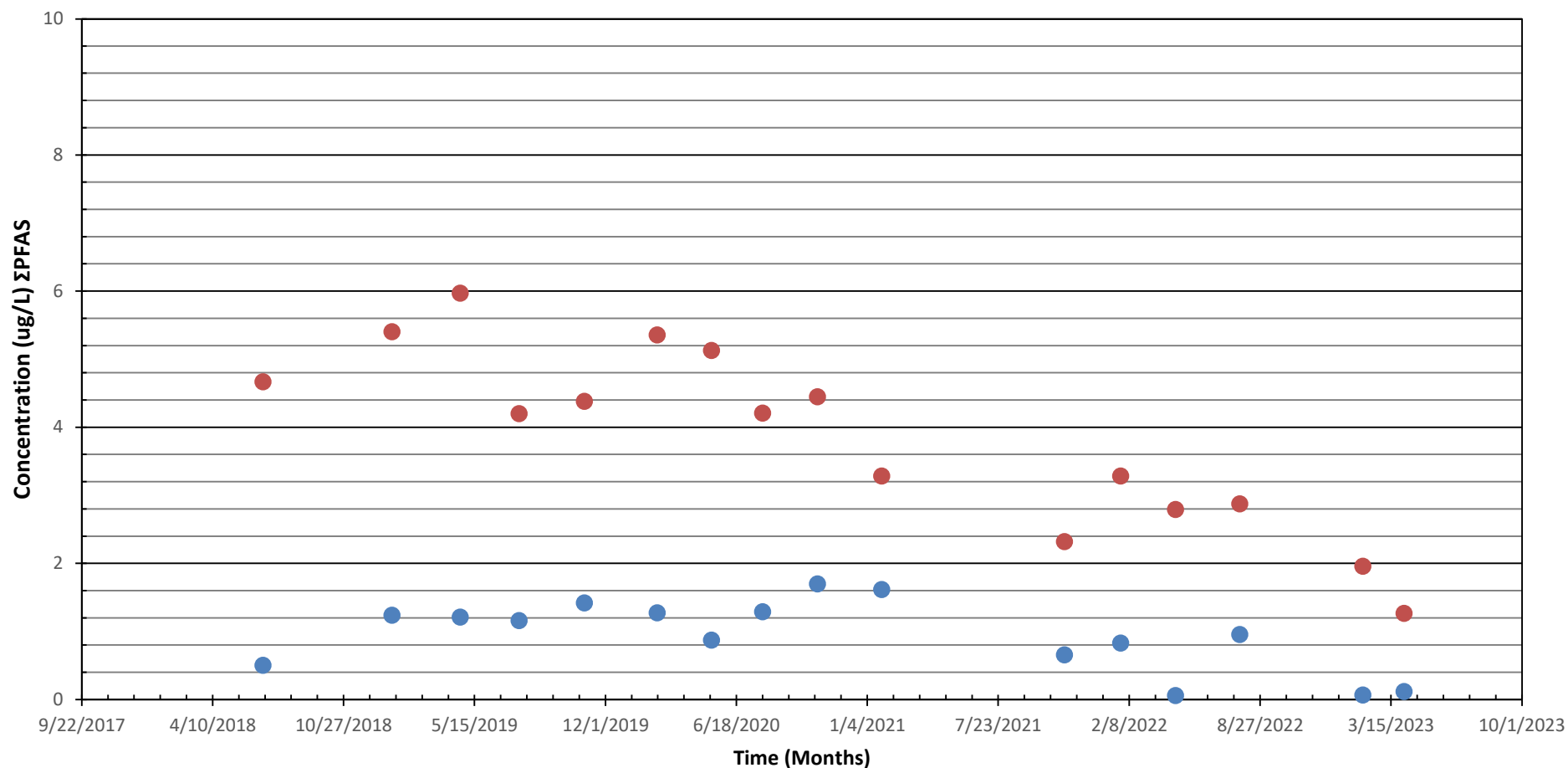
Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA
RTN 4-26179



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 (µg/L) or parts per billion (ppb) .

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



Barnstable County Fire & Rescue Training Academy
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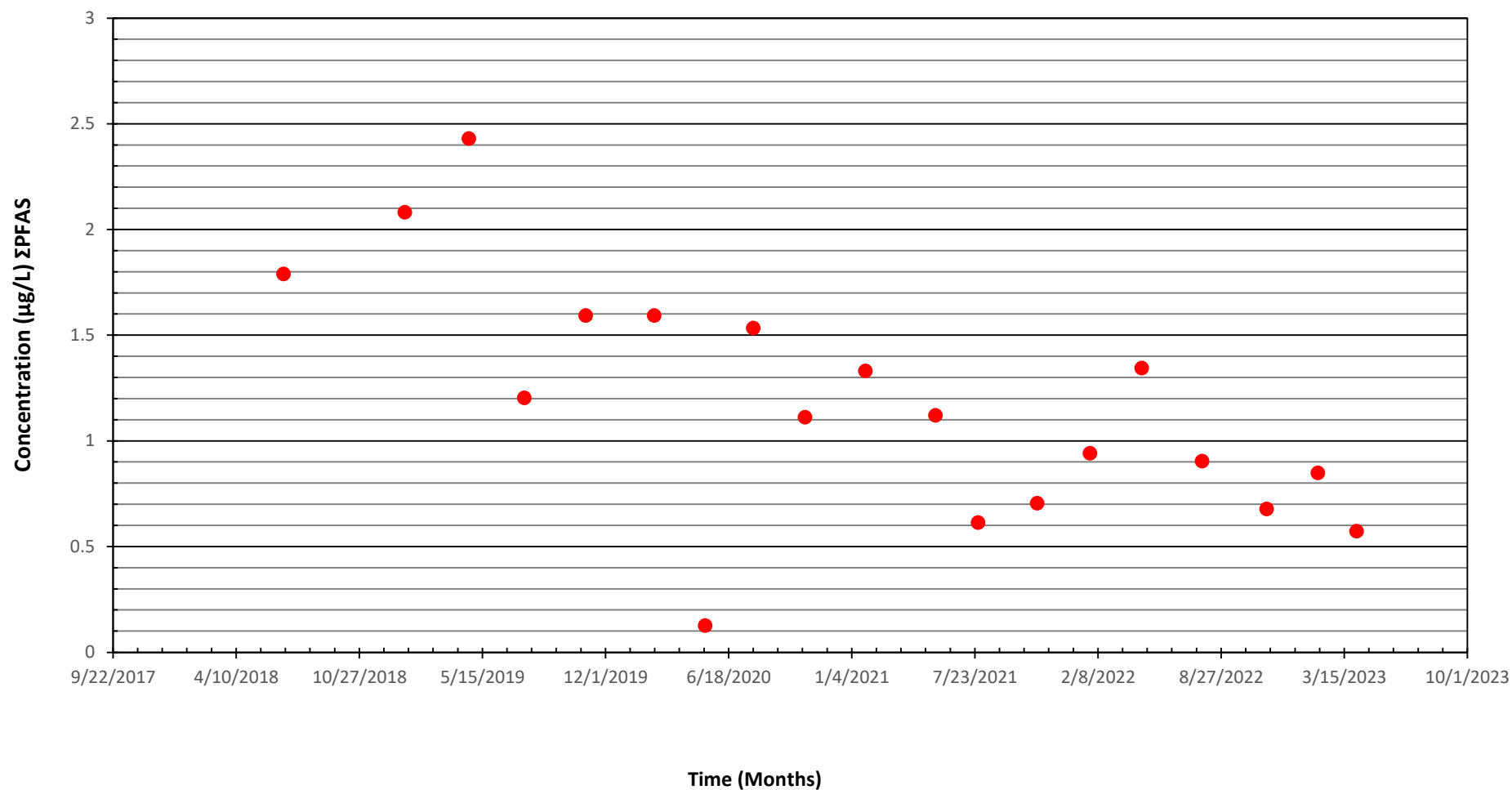
● MW-22 ● MW-12S



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 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 - April 2023



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

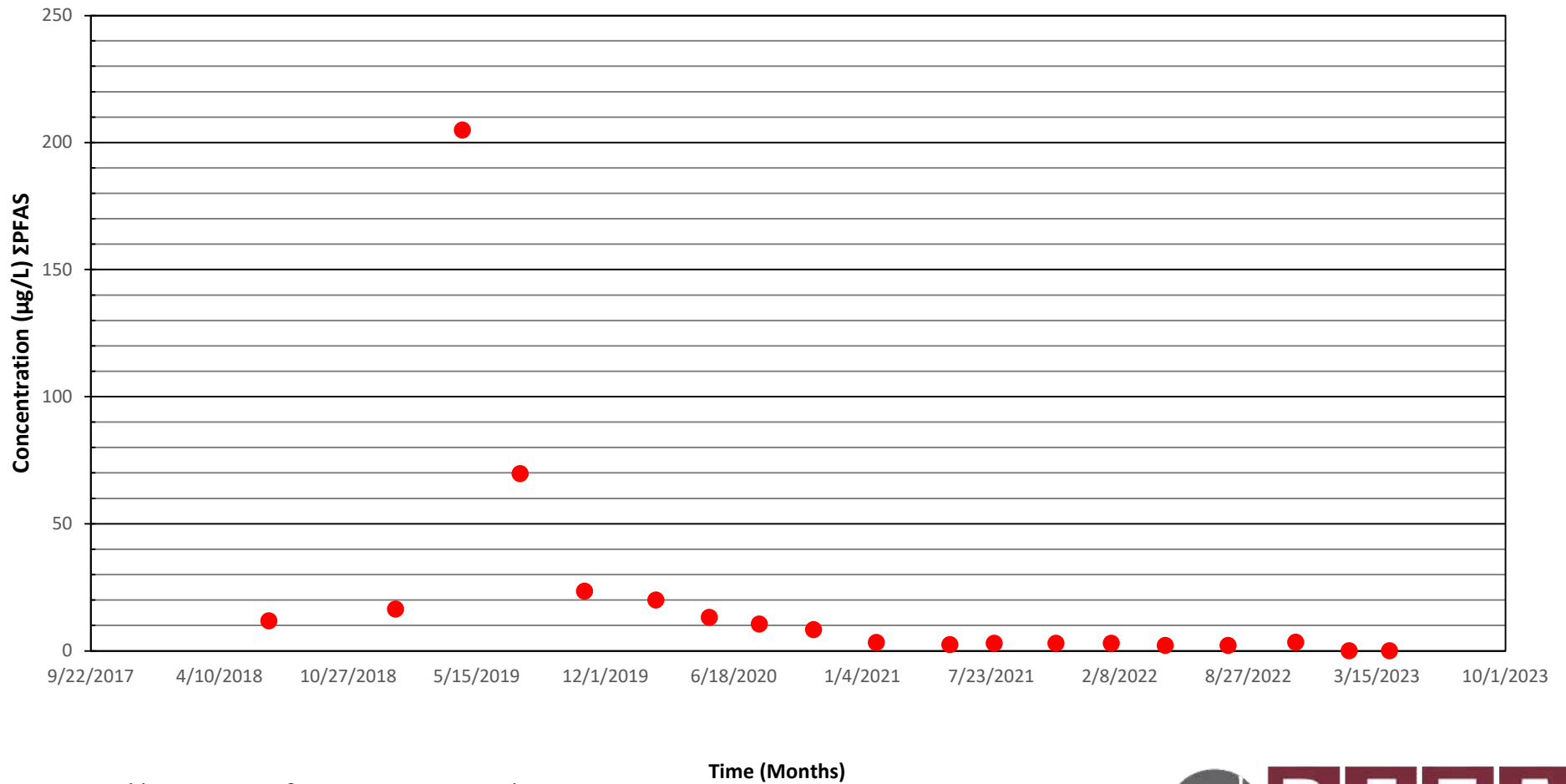
● PC-6A



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 - April 2023



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

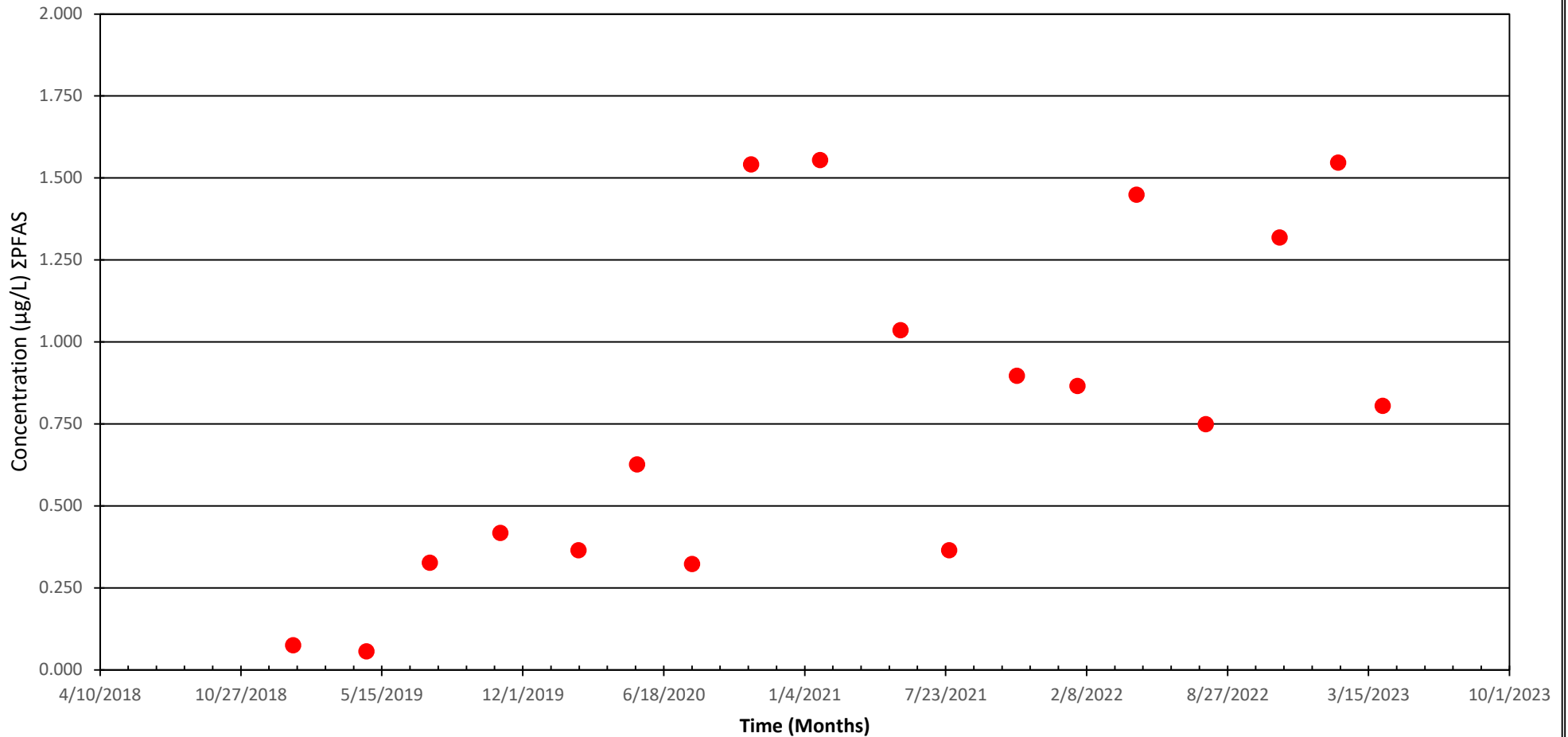
● PC-11



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 - April 2023



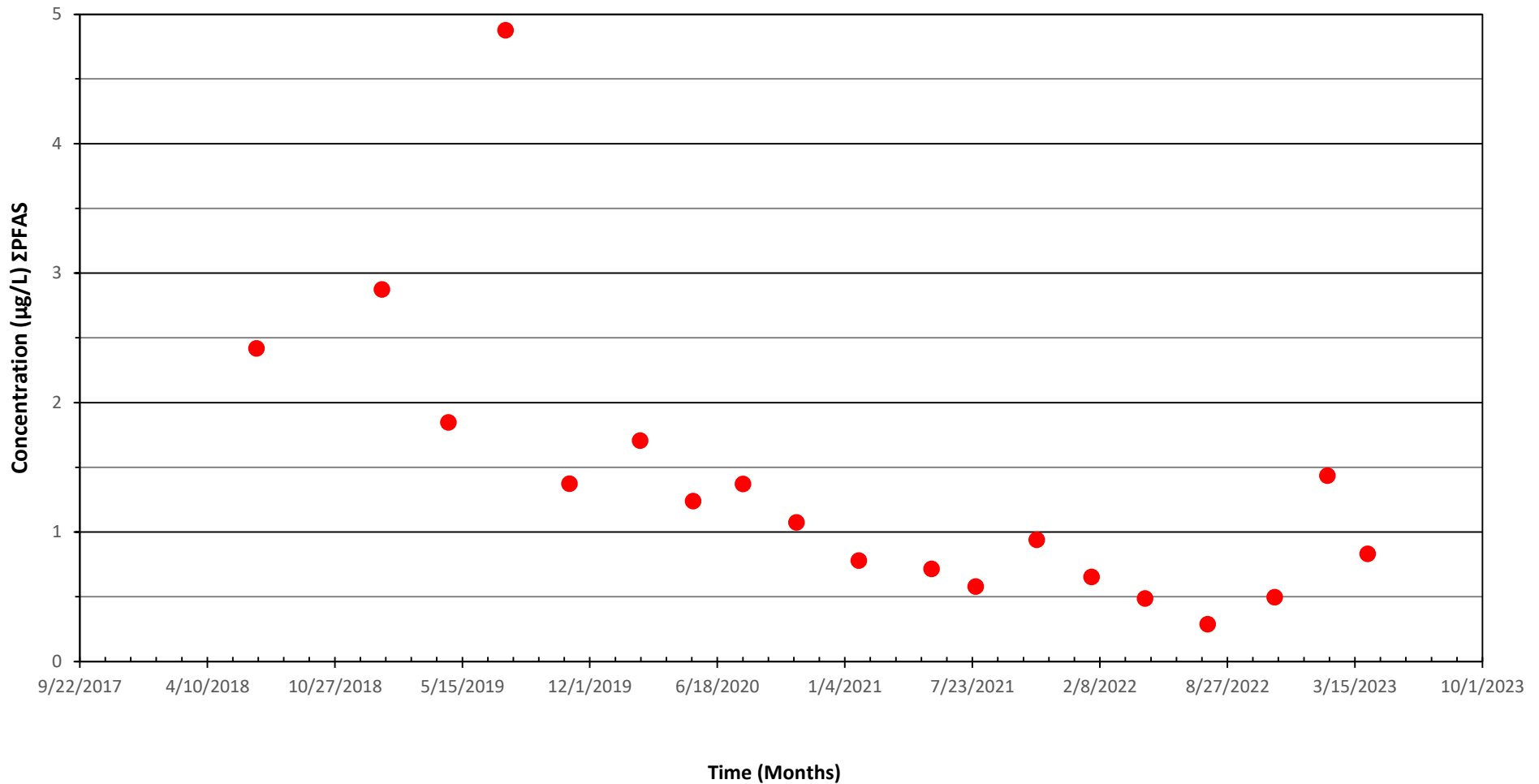
Barnstable County Fire & Rescue Training Academy
155 South Flint Rock Road, Barnstable, MA
RTN 4-26179



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 - April 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).

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)

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☐ 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

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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 CAPPED 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;

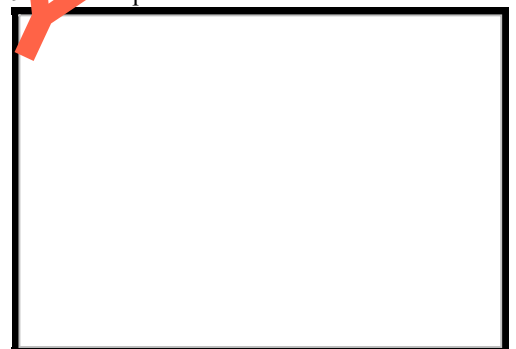
> if Section B of this form indicates that an **Imminent Hazard Evaluation** is being submitted, this Imminent Hazard Evaluation was developed in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and the assessment activity(ies) undertaken to support this Imminent Hazard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

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): _____

DRAFT COPY



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: of:

-

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: 1/1/2023

To: 6/30/2023

(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: 181

b. GW Recovered (gals): 2339811

c. NAPL Recovered (gals):

d. GW Discharged (gals): 2339811

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

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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: 1 b. Total Number of Days of Scheduled Shutdowns: 0

c. Reason(s) for Scheduled Shutdowns: TANK WASTEWATER MAINTENANCE

☐ 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

☐ 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 ☐ GroundWater Concentration Pressure Differential				
SYSTEM	01/16/2023	PFAS6	0.700	0.016		☒	0.020	UG/L	YES
SYSTEM	02/10/2023	PFAS6	0.554			☒	0.020	UG/L	YES
SYSTEM	03/13/2023	PFAS6	0.684			☒	0.020	UG/L	YES
SYSTEM	04/18/2023	PFAS6	0.552			☒	0.020	UG/L	YES
SYSTEM	05/11/2023	PFAS6	0.470			☒	0.020	UG/L	YES
SYSTEM	05/06/2023	PFAS6	0.810	0.010		☒	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

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: 1/1/2023

To: 6/30/2023

(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: 181

b. GW Recovered (gals): 2325150

c. NAPL Recovered (gals):

d. GW Discharged (gals): 2325150

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: 1 b. Total Number of Days of Scheduled Shutdowns: 0

c. Reason(s) for Scheduled Shutdowns: TANK WASTEWATER MAINTENANCE

☐ 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 FLOW RATE AND VOLUMES DUE TO IRON FOULING

☐ 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: 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)	(check one)	Check here, if ND/BDL	Permissible Concentration or Pressure Differential	Units	Within Permissible Limits? (Y/N)
					☒ Discharge ☐ GroundWater Concentration Pressure Differential				
SYSTEM	01/16/2023	PFAS6	0.700	0.006		☒	0.020	UG/L	YES
SYSTEM	02/10/2023	PFAS6	0.554	0.05		☒	0.020	UG/L	YES
SYSTEM	03/13/2023	PFAS6	0.684	0.160		☒	0.020	UG/L	YES
SYSTEM	04/18/2023	PFAS6	0.552			☒	0.020	UG/L	YES
SYSTEM	05/11/2023	PFAS6	0.470			☒	0.020	UG/L	YES
SYSTEM	05/06/2023	PFAS6	0.810			☒	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 Ruzala, P.E.
Assets and Infrastructure Manager
(508) 419-2860
paul.ruzala@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 Ruzala". The signature is written in a cursive, flowing style.

Paul Ruzala, P.E.
Assets and Infrastructure Manager

Statement of Provisions
Attachment To:

BWSC 105 – IRA Transmittal Form, Section H, Item 2

For
Former Barnstable County Fire & Rescue Training Academy
(FTA)
155 South Flint Rock Road
Hyannis, MA 02630
RTN 4-26179

The FTA facility was donated to the Town of Barnstable by the Cobb Trust in 1955, when it began to be used as a fire training area. The current owner-of-record is the County of Barnstable, which acquired the Site from the Town in 1983. The FTA was used for public safety training from the 1950's through 2019. Fires (for training purposes) were ignited and then extinguished with water CO₂, and/or aqueous film-forming foam (AFFF). The FTA was 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.

Under the USEPA's Third Unregulated Contaminant Monitoring Rule (UCMR3) for "emerging contaminants" in public water supplies, samples collected from three of the Town of Barnstable Mary Dunn public water supply wells were analyzed for PFAS (PFOS and PFOA) in November 2013. Analytical results revealed evidence of PFOS contamination in all three wells sampled. Subsequently, Barnstable County collected soils and groundwater samples from the FTA, which is located west and likely upgradient of the Mary Dunn wells. Groundwater analytical results revealed that FTA groundwater was impacted by PFOS and MassDEP was notified. In 2015, Barnstable County funded an initial hydrogeological assessment, implementation of a groundwater pump and treat system to capture PFOS upgradient of the Mary Dunn wells, and additional assessment and immediate response actions.

Massachusetts Department of Environmental Protection (MassDEP) issued a Notice of Responsibility (NOR) to Barnstable County on August 4, 2016. MassDEP determined that the releases of PFAS from the use of AFFF at the FTA is a source of PFAS affecting the water supply of the Mary Dunn wells. MassDEP requested Immediate Response Action (IRA) response actions to include:

- Evaluation of potential Imminent Hazards.
- Assessment and monitoring of nearby public and private water supply wells.
- Prevention, elimination, and/or abate of any hazards associated with the
- consumption of drinking water impacted by PFAS above the USEPA Health Advisory (HA) level of 0.07 µg/L¹.
- Excavation and off-site removal of impacted soils located in a "hot spot" area; and/or expansion of the existing groundwater recovery and treatment system.

MassDEP issued a *Notice of Audit Findings – Immediate Response Action Field Inspection and Request For IRA Modification/Interim Deadline* on June 1, 2018 (NOAF/Request For IRA Modification). In the NOAF/Request For IRA Modification MassDEP indicated that the IRAs currently being conducted at the Site comply with the

¹ Since MassDEP finalization of the MCP Method 1 groundwater standards for PFAS and Maximum Contaminant Limit (MCL) for PFAS in drinking water in December 2019 and October 2020 respectively, current and future IRA response actions implemented at the Site will address the groundwater and drinking water impacted by PFAS above the Method 1 groundwater standards and drinking water MCL. The Method 1 groundwater standards and MCL supersede the USEPA HA.

relevant regulations and the IRA Plan previously submitted. However, the NOAF/Request For IRA Modification indicated that MassDEP had determined that additional IRA response actions were necessary at the Site to minimize continued mobilization of contaminants. MassDEP required the submittal of an IRA Plan Modification that included the installation of drainage controls and/or construction of berms, dikes, or impoundments at the Site to prevent stormwater and/or water from fire training activities from entering the Hot Spot area. The IRA Plan Modification was to be submitted to MassDEP on or before June 29, 2018. This IRA Plan Modification was submitted on June 29, 2018 and subsequently executed in December 2018 through March 2019 following local permitting by the Town of Barnstable Conservation Commission.

MassDEP issued a *Notice of Audit Findings/Compliance and Technical Assistance /Interim Deadline* dated November 21, 2018 (NOAF/Interim Deadline). The evaluations and additional information required by the NOAF/Interim Deadline document were presented in Immediate Response Action (IRA) Status and Remedial Monitoring Report (RMR) No. 27, submitted on February 28, 2019. In the February Status report, planned actions to address breakthrough of PFAS from the activated carbon were described, as was a long-term groundwater monitoring plan.

The November 21, 2018 NOAF/Interim Deadline also required the evaluation of the feasibility of an expansion of groundwater pumping and treatment, and, if an expansion is feasible, a definitive IRA Plan Modification for such expansion to be presented in the next full IRA Status Report (August 2019.) Expanding the existing groundwater recovery and treatment system, both in terms of pumping rate and locations, was evaluated and judged to be feasible. Based on limited funds available, a short-term expansion of groundwater pumping and treatment was judged to likely be financially feasible to implement within the required time frame dictated by the November 21, 2018 NOAF/Interim Deadline.

The NOAF/Interim Deadline also required the evaluation of the feasibility of placing a more robust cap over the former Hot Spot area and the Fire Training Area. If such capping measures were feasible, a definitive IRA Plan Modification for such capping was required in the next full IRA Status Report (August 2019.) The implementation of a more robust cap system in the Hot Spot area was considered not feasible, in the opinion of Barnstable County or BETA Group Inc. (BETA) and its LSP, based on the very recent implementation of a cap system in the Hot Spot area. The implementation of a more robust cap system over portions of or most of the FTA training area was considered not feasible within the time frame specified in the NOAF/Interim Deadline, in the opinion of Barnstable County or BETA, based on multiple factors.

MassDEP issued a *Request For Expedited IRA Plan Modification/Interim Deadline Enforcement Document No. 00006694* on May 1, 2019 that requested that the County submit an expedited IRA Plan Modification by June 28, 2019 including detailed plans for expansion of the groundwater recovery and treatment system and for capping to prevent infiltration of precipitation through PFAS-contaminated soil at the Site. On June 3, 2019, the County submitted a formal request to restore the original IRA Plan Modification Deadline to August 28, 2019, indicating that it was not technically feasible to meet the expedited deadline and that the Public Involvement Plan for the Site required that the document be a public comment draft only. The County received email response from MassDEP indicating that the County's request was accepted and the deadline for the IRA Plan Modification was restored to August 28, 2019.

Following the receipt of public comment, the IRA Plan Modification was finalized and submitted to DEP on December 20, 2019 and DEP contingently approved the capping design. The December 2019 IRA Plan Modification was the second IRA Plan modification proposed and approved for the Disposal Site and will therefore be described as IRA Plan Modification No. 2.

BETA, on behalf of Barnstable County, proceeded with the design of the major capping and stormwater improvements project. BETA submitted the original Notice of Intent for the capping project to the Town of Barnstable Conservation Commission (the Commission) in February 2020. Based on the public and Commission

comments and the decision by the County to permanently end live-fire training at the FTA, the County opted to include the demolition of the two former, live-fire training buildings and all training props at the FTA in the capping project. Following multiple hearings and re-design of the project, the Commission approved the capping design and the public hearing was closed On November 10, 2020. On December 30, 2020, The Barnstable Conservation Commission issued the *Order of Conditions: Special Conditions of Approval (SE3-5772)*.

Based on the decision to include building and training prop demolition in the project, MassDEP requested the filing of an IRA Plan Modification to formalize those inclusions. Following the receipt of public comment on the Draft IRA Plan Modification, IRA Plan Modification No. 3 was finalized and submitted to DEP on June 22, 2021 as an amendment to both the original (September 2016) IRA Plan and the December 2019 IRA Plan Modification. IRA Plan Modification No. 3 presented the selected building demolition design revisions and several minor other additions to the capping project, added during the local approval process. MassDEP issued the *Conditional Approval – Final Immediate Response Action Plan Modification No. 3* on July 8, 2021. The Condition Approval included:

- 1) notifying MassDEP at least 72 hours before start of response actions.
- 2) Complying with MCP requirements for any new reportable conditions.
- 3) Continuing PIP activities
- 4) Complying with MassDEP and federal regulations for solid waste and hazardous waste and materials.
- 5) Complying with municipal permitting requirements.

Construction for the capping and select demolition project started in late August 2021 and was substantially completed in November 2021. Project closeout extended through 2022.

Barnstable County issued a *Notice of Delay of Filing the Phase II Comprehensive Site Assessment Report* dated April 1, 2021. The Notice indicated that due to multiple factors including those related to temporary cessation of all but basic IRA work at the Site due to emergency obligations to respond to the COVID-19 pandemic and the requirements of local permitting and re-design of the capping project, the Phase II CSA Report filing would be delayed.

MassDEP issued the *Notice of Noncompliance Enforcement Document No. 00010606* on May 25, 2021. The Notice stated that the Phase II Comprehensive Site Assessment (CSA) Report had not been submitted by its due date of May 7, 2021. The Notice noted that the County had submitted a Notification of Delay for the Phase II Report but had not included a specific date for submittal of the report. The Notice stated that a Phase II Comprehensive Site Assessment Report must be submitted by May 9, 2022.

Barnstable County issued a response to the MassDEP *Notice of Noncompliance Enforcement Document No. 00010606* on June 7, 2021. The response again noted the reasons for the delay in executing the Phase II CSA and noted that the work related to the Phase II CSA, including preparation of the mandated Phase II CSA Scope of Work (Public Comment Draft and Final) and execution of the Phase II CSA tasks would be proceeding.

MassDEP issued the *Administrative Consent Order – Enforcement Document No. 0031761* on February 27, 2023, which presented a Draft Administrative Consent Order for all comprehensive MCP response actions to be conducted at the Site. Barnstable County and MassDEP are in deliberations regarding the Draft ACO as of April and May 2023.

APPENDIX B

LABORATORY REPORTS/CERTIFICATES OF ANALYSIS Groundwater Treatment Systems Performance Monitoring

February 17, 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: 23A1761

Enclosed are results of analyses for samples as received by the laboratory on January 18, 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: 2/17/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23A1761

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)	23A1761-01	Ground Water		SOP-454 PFAS	
System #1 Mid	23A1761-02	Ground Water		SOP-454 PFAS	
System #1 Eff	23A1761-03	Ground Water		SOP-454 PFAS	
System #2 Mid	23A1761-04	Ground Water		SOP-454 PFAS	
System #2 Eff	23A1761-05	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:****D-01**

Sample extracted/prepared at a dilution due to sample matrix interference.

Analyte & Samples(s) Qualified:

23A1761-01[INF (PRW-4)]

M8PFOS

23A1761-01RE1[INF (PRW-4)]

Perfluorooctanesulfonic acid (PFOS)

23A1761-01RE1[INF (PRW-4)]

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)**

B329177-MS2

N-MeFOSAA (NMeFOSAA)

B329177-MS2

Perfluorooctanesulfonic acid (PFOS)

B329177-MSD2

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:**Perfluoroheptanesulfonic acid (PFHpS)**

B329177-MS2

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:**M2-8:2FTS**

B329177-BLK1, S083392-IBL1

M3HFPO-DA

23A1761-01[INF (PRW-4)], 23A1761-02[System #1 Mid], 23A1761-05[System #2 Eff], B329177-BLK1

PF-18

Duplicate analysis confirmed Extracted Internal Standard failure due to matrix effects.

Analyte & Samples(s) Qualified:**M2-8:2FTS**

B329177-MS2, B329177-MSD2

M3HFPO-DA

B329177-MS2, B329177-MSD2

PF-19

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

Analyte & Samples(s) Qualified:**Perfluorooctanesulfonic acid (PFOS)**

23A1761-01RE1[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:**Perfluoroheptanesulfonic acid (PFHpS)**

B329177-MSD2

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**M2-4:2FTS**

23A1761-04[System #2 Mid], 23A1761-05[System #2 Eff]

M2-8:2FTS

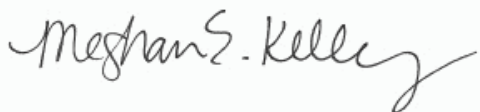
B329177-BS1

M3HFPO-DA

B329177-BS1

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: 23A1761

Date Received: 1/18/2023

Field Sample #: INF (PRW-4)

Sampled: 1/16/2023 12:50

Sample ID: 23A1761-01

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)	20	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorobutanesulfonic acid (PFBS)	7.2	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluoropentanoic acid (PFPeA)	61	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorohexanoic acid (PFHxA)	55	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	26	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorodecanoic acid (PFDA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorododecanoic acid (PFDoA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluoroheptanesulfonic acid (PFHpS)	5.3	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
N-EtFOSAA (NEtFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
N-MeFOSAA (NMeFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorotetradecanoic acid (PFTA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorooctanesulfonamide (FOSA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorononanesulfonic acid (PFNS)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	43	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluoro-1-butanefulfonamide (FBFA)	10	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorohexanesulfonic acid (PFHxS)	100	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	58	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluoropentanesulfonic acid (PFPeS)	10	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluoroundecanoic acid (PFUnA)	32	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluoroheptanoic acid (PFHpA)	33	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorooctanoic acid (PFOA)	20	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB
Perfluorooctanesulfonic acid (PFOS)	530	41	ng/L	10	D-01, PF-19	SOP-454 PFAS	1/23/23	1/30/23 21:08	QNW
Perfluorononanoic acid (PFNA)	17	4.1	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 20:56	RRB

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23A1761

Date Received: 1/18/2023

Field Sample #: System #1 Mid

Sampled: 1/16/2023 12:40

Sample ID: 23A1761-02

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	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluoropentanoic acid (PFPeA)	3.1	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorohexanoic acid (PFHxA)	2.4	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorohexanesulfonic acid (PFHxS)	3.1	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	2.2	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorooctanesulfonic acid (PFOS)	13	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:03	RRB

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23A1761

Date Received: 1/18/2023

Sampled: 1/16/2023 12:30

Field Sample #: System #1 Eff

Sample ID: 23A1761-03

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	2/1/23	2/14/23 17:58	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 17:58	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23A1761

Date Received: 1/18/2023

Field Sample #: System #2 Mid

Sampled: 1/16/2023 12:15

Sample ID: 23A1761-04

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	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorooctanesulfonic acid (PFOS)	5.7	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	2/1/23	2/14/23 18:05	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23A1761

Date Received: 1/18/2023

Field Sample #: System #2 Eff

Sampled: 1/16/2023 12:20

Sample ID: 23A1761-05

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	1/23/23	1/27/23 21:10	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	4.2	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	1/23/23	1/27/23 21:10	RRB

Sample Extraction Data

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23A1761-01 [INF (PRW-4)]	B329177	122	1.00	01/23/23
23A1761-01RE1 [INF (PRW-4)]	B329177	122	1.00	01/23/23
23A1761-02 [System #1 Mid]	B329177	264	1.00	01/23/23
23A1761-05 [System #2 Eff]	B329177	278	1.00	01/23/23

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23A1761-03 [System #1 Eff]	B331319	276	1.00	02/01/23
23A1761-04 [System #2 Mid]	B331319	279	1.00	02/01/23

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

Batch B329177 - SOP 454-PFAAS
Blank (B329177-BLK1)

Prepared: 01/23/23 Analyzed: 01/27/23

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 (B329177-BS1)

Prepared: 01/23/23 Analyzed: 01/27/23

Perfluorobutanoic acid (PFBA)	8.63	1.9	ng/L	9.39	92.0	73-129
Perfluorobutanesulfonic acid (PFBS)	7.73	1.9	ng/L	8.31	93.0	72-130
Perfluoropentanoic acid (PFPeA)	8.83	1.9	ng/L	9.39	94.1	72-129
Perfluorohexanoic acid (PFHxA)	8.94	1.9	ng/L	9.39	95.3	72-129
11Cl-PF3OUdS (F53B Major)	7.89	1.9	ng/L	8.84	89.2	55.1-141
9Cl-PF3ONS (F53B Minor)	8.65	1.9	ng/L	8.75	98.9	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.38	1.9	ng/L	8.84	94.8	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.37	1.9	ng/L	9.39	89.2	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	8.57	1.9	ng/L	9.01	95.1	67-138
Perfluorodecanoic acid (PFDA)	8.46	1.9	ng/L	9.39	90.1	71-129
Perfluorododecanoic acid (PFDoA)	8.58	1.9	ng/L	9.39	91.4	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	8.64	1.9	ng/L	8.35	103	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

Batch B329177 - SOP 454-PFAAS
LCS (B329177-BS1)

Prepared: 01/23/23 Analyzed: 01/27/23

Perfluoroheptanesulfonic acid (PFHpS)	10.1	1.9	ng/L	8.96		113	69-134			
N-EtFOSAA (NEtFOSAA)	11.7	1.9	ng/L	9.39		125	61-135			
N-MeFOSAA (NMeFOSAA)	12.1	1.9	ng/L	9.39		129	65-136			
Perfluorotetradecanoic acid (PFTA)	8.64	1.9	ng/L	9.39		92.1	71-132			
Perfluorotridecanoic acid (PFTTrDA)	9.01	1.9	ng/L	9.39		96.0	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.25	1.9	ng/L	8.78		94.0	63-143			
Perfluorodecanesulfonic acid (PFDS)	6.81	1.9	ng/L	9.06		75.2	53-142			
Perfluorooctanesulfonamide (FOSA)	9.32	1.9	ng/L	9.39		99.3	67-137			
Perfluorononanesulfonic acid (PFNS)	8.35	1.9	ng/L	9.01		92.6	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	8.78	1.9	ng/L	9.39		93.6	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	8.18	1.9	ng/L	9.39		87.1	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	7.42	1.9	ng/L	8.59		86.4	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	10.0	1.9	ng/L	9.39		107	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	10.3	1.9	ng/L	9.39		110	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	9.46	1.9	ng/L	8.92		106	64-140			
Perfluoropentanesulfonic acid (PFPeS)	8.12	1.9	ng/L	8.82		92.1	71-127			
Perfluoroundecanoic acid (PFUnA)	9.20	1.9	ng/L	9.39		98.0	69-133			
Nonafluoro-3,6-dioxahexanoic acid (NFDHA)	10.9	1.9	ng/L	9.39		116	58.5-143			
Perfluoroheptanoic acid (PFHpA)	8.80	1.9	ng/L	9.39		93.8	72-130			
Perfluorooctanoic acid (PFOA)	8.34	1.9	ng/L	9.39		88.9	71-133			
Perfluorooctanesulfonic acid (PFOS)	8.34	1.9	ng/L	8.68		96.1	65-140			
Perfluorononanoic acid (PFNA)	9.32	1.9	ng/L	9.39		99.3	69-130			

Matrix Spike (B329177-MS2)
Source: 23A1761-02

Prepared: 01/23/23 Analyzed: 01/27/23

Perfluorobutanoic acid (PFBA)	10.9	1.8	ng/L	9.11	1.80	99.8	73-129			
Perfluorobutanesulfonic acid (PFBS)	7.96	1.8	ng/L	8.06	ND	98.7	72-130			
Perfluoropentanoic acid (PFPeA)	12.4	1.8	ng/L	9.11	3.07	102	72-129			
Perfluorohexanoic acid (PFHxA)	12.0	1.8	ng/L	9.11	2.37	106	72-129			
11Cl-PF3OUdS (F53B Major)	8.25	1.8	ng/L	8.58	ND	96.1	58.3-140			
9Cl-PF3ONS (F53B Minor)	9.55	1.8	ng/L	8.49	ND	112	61.4-144			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.86	1.8	ng/L	8.58	ND	103	62.4-128			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	6.68	1.8	ng/L	9.11	ND	73.4	36.7-171			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.4	1.8	ng/L	8.74	0.780	110	67-138			
Perfluorodecanoic acid (PFDA)	9.32	1.8	ng/L	9.11	ND	102	71-129			
Perfluorododecanoic acid (PFDoA)	9.48	1.8	ng/L	9.11	ND	104	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	9.06	1.8	ng/L	8.11	ND	112	54.3-149			
Perfluoroheptanesulfonic acid (PFHpS)	12.1	1.8	ng/L	8.70	ND	139	* 69-134			MS-23
N-EtFOSAA (NEtFOSAA)	12.9	1.8	ng/L	9.11	ND	141	* 61-135			MS-22
N-MeFOSAA (NMeFOSAA)	13.3	1.8	ng/L	9.11	ND	147	* 65-136			MS-22
Perfluorotetradecanoic acid (PFTA)	9.13	1.8	ng/L	9.11	ND	100	71-132			
Perfluorotridecanoic acid (PFTTrDA)	9.09	1.8	ng/L	9.11	ND	99.8	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.35	1.8	ng/L	8.52	ND	98.0	63-143			
Perfluorodecanesulfonic acid (PFDS)	7.02	1.8	ng/L	8.79	ND	79.8	53-142			
Perfluorooctanesulfonamide (FOSA)	11.0	1.8	ng/L	9.11	ND	121	67-137			
Perfluorononanesulfonic acid (PFNS)	9.77	1.8	ng/L	8.74	ND	112	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	10.6	1.8	ng/L	9.11	1.07	105	64.2-154			
Perfluoro-1-butanefulfonamide (FBSA)	10.1	1.8	ng/L	9.11	ND	111	65.9-140			
Perfluorohexanesulfonic acid (PFHxS)	11.6	1.8	ng/L	8.33	3.07	102	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	10.4	1.8	ng/L	9.11	ND	115	61.9-143			
Perfluoro-5-oxahexanoic acid (PFMBA)	10.6	1.8	ng/L	9.11	ND	117	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

Batch B329177 - SOP 454-PFAAS

Matrix Spike (B329177-MS2)		Source: 23A1761-02		Prepared: 01/23/23		Analyzed: 01/27/23				
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12.1	1.8	ng/L	8.65	2.25	114	64-140			
Perfluoropetanesulfonic acid (PFPeS)	9.18	1.8	ng/L	8.56	ND	107	71-127			
Perfluoroundecanoic acid (PFUnA)	11.3	1.8	ng/L	9.11	0.849	115	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	11.8	1.8	ng/L	9.11	ND	130	62-138			
Perfluoroheptanoic acid (PFHpA)	10.1	1.8	ng/L	9.11	1.30	97.1	72-130			
Perfluorooctanoic acid (PFOA)	9.47	1.8	ng/L	9.11	0.713	96.2	71-133			
Perfluorooctanesulfonic acid (PFOS)	22.6	1.8	ng/L	8.43	12.8	116	65-140			
Perfluorononanoic acid (PFNA)	9.85	1.8	ng/L	9.11	ND	108	69-130			

Matrix Spike Dup (B329177-MSD2)		Source: 23A1761-02		Prepared: 01/23/23		Analyzed: 01/27/23				
Perfluorobutanoic acid (PFBA)	9.32	1.9	ng/L	9.57	1.80	78.5	73-129	15.6	30	
Perfluorobutanesulfonic acid (PFBS)	6.98	1.9	ng/L	8.47	ND	82.4	72-130	13.1	30	
Perfluoropentanoic acid (PFPeA)	10.5	1.9	ng/L	9.57	3.07	78.0	72-129	16.3	30	
Perfluorohexanoic acid (PFHxA)	10.2	1.9	ng/L	9.57	2.37	81.7	72-129	16.2	30	
11Cl-PF3OUdS (F53B Major)	7.36	1.9	ng/L	9.01	ND	81.6	58.3-140	11.4	30	
9Cl-PF3ONS (F53B Minor)	8.50	1.9	ng/L	8.92	ND	95.3	61.4-144	11.6	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	7.98	1.9	ng/L	9.01	ND	88.5	62.4-128	10.5	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.19	1.9	ng/L	9.57	ND	85.6	36.7-171	20.3	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	8.72	1.9	ng/L	9.19	0.780	86.4	67-138	17.8	30	
Perfluorodecanoic acid (PFDA)	8.15	1.9	ng/L	9.57	ND	85.2	71-129	13.4	30	
Perfluorododecanoic acid (PFDoA)	8.25	1.9	ng/L	9.57	ND	86.2	72-134	13.9	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	7.76	1.9	ng/L	8.52	ND	91.1	54.3-149	15.5	30	
Perfluoroheptanesulfonic acid (PFHpS)	8.85	1.9	ng/L	9.14	ND	96.8	69-134	31.1	*	30
N-EtFOSAA (NEtFOSAA)	10.1	1.9	ng/L	9.57	ND	106	61-135	23.9	30	R-06
N-MeFOSAA (NMeFOSAA)	10.3	1.9	ng/L	9.57	ND	108	65-136	25.5	30	
Perfluorotetradecanoic acid (PFTA)	8.01	1.9	ng/L	9.57	ND	83.7	71-132	13.1	30	
Perfluorotridecanoic acid (PFTrDA)	8.09	1.9	ng/L	9.57	ND	84.5	65-144	11.6	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	7.03	1.9	ng/L	8.95	ND	78.5	63-143	17.2	30	
Perfluorodecanesulfonic acid (PFDS)	6.33	1.9	ng/L	9.23	ND	68.5	53-142	10.4	30	
Perfluorooctanesulfonamide (FOSA)	9.12	1.9	ng/L	9.57	ND	95.3	67-137	18.9	30	
Perfluorononanesulfonic acid (PFNS)	8.38	1.9	ng/L	9.19	ND	91.2	69-127	15.3	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	9.96	1.9	ng/L	9.57	1.07	92.9	64.2-154	6.37	30	
Perfluoro-1-butanedisulfonamide (FBSA)	8.63	1.9	ng/L	9.57	ND	90.2	65.9-140	15.4	30	
Perfluorohexanesulfonic acid (PFHxS)	10.0	1.9	ng/L	8.76	3.07	79.1	68-131	14.7	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	9.06	1.9	ng/L	9.57	ND	94.6	61.9-143	14.2	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	9.20	1.9	ng/L	9.57	ND	96.1	61.4-142	14.3	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	9.72	1.9	ng/L	9.09	2.25	82.2	64-140	22.1	30	
Perfluoropetanesulfonic acid (PFPeS)	7.91	1.9	ng/L	9.00	ND	87.9	71-127	14.9	30	
Perfluoroundecanoic acid (PFUnA)	9.59	1.9	ng/L	9.57	0.849	91.4	69-133	16.6	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.81	1.9	ng/L	9.57	ND	103	62-138	18.8	30	
Perfluoroheptanoic acid (PFHpA)	8.93	1.9	ng/L	9.57	1.30	79.7	72-130	12.7	30	
Perfluorooctanoic acid (PFOA)	8.21	1.9	ng/L	9.57	0.713	78.3	71-133	14.3	30	
Perfluorooctanesulfonic acid (PFOS)	17.2	1.9	ng/L	8.85	12.8	50.3	*	65-140	26.8	30
Perfluorononanoic acid (PFNA)	8.72	1.9	ng/L	9.57	ND	91.1	69-130	12.2	30	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

Batch B331319 - SOP 454-PFAAS
Blank (B331319-BLK1)

Prepared: 02/01/23 Analyzed: 02/14/23

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 (B331319-BS1)

Prepared: 02/01/23 Analyzed: 02/14/23

Perfluorobutanoic acid (PFBA)	10.1	1.8	ng/L	8.95	112	73-129
Perfluorobutanesulfonic acid (PFBS)	8.64	1.8	ng/L	7.92	109	72-130
Perfluoropentanoic acid (PFPeA)	9.90	1.8	ng/L	8.95	111	72-129
Perfluorohexanoic acid (PFHxA)	9.96	1.8	ng/L	8.95	111	72-129
11Cl-PF3OUdS (F53B Major)	7.29	1.8	ng/L	8.43	86.4	55.1-141
9Cl-PF3ONS (F53B Minor)	7.80	1.8	ng/L	8.34	93.5	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.89	1.8	ng/L	8.43	105	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.30	1.8	ng/L	8.95	104	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.48	1.8	ng/L	8.59	110	67-138
Perfluorodecanoic acid (PFDA)	10.5	1.8	ng/L	8.95	117	71-129
Perfluorododecanoic acid (PFDoA)	10.7	1.8	ng/L	8.95	119	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	8.70	1.8	ng/L	7.97	109	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

Batch B331319 - SOP 454-PFAAS
LCS (B331319-BS1)

Prepared: 02/01/23 Analyzed: 02/14/23

Perfluoroheptanesulfonic acid (PFHpS)	10.7	1.8	ng/L	8.55		125	69-134			
N-EtFOSAA (NEtFOSAA)	11.6	1.8	ng/L	8.95		129	61-135			
N-MeFOSAA (NMeFOSAA)	11.1	1.8	ng/L	8.95		124	65-136			
Perfluorotetradecanoic acid (PFTA)	10.4	1.8	ng/L	8.95		116	71-132			
Perfluorotridecanoic acid (PFTTrDA)	10.4	1.8	ng/L	8.95		116	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.21	1.8	ng/L	8.37		110	63-143			
Perfluorodecanesulfonic acid (PFDS)	7.90	1.8	ng/L	8.64		91.4	53-142			
Perfluorooctanesulfonamide (FOSA)	10.6	1.8	ng/L	8.95		119	67-137			
Perfluorononanesulfonic acid (PFNS)	9.05	1.8	ng/L	8.59		105	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	10.1	1.8	ng/L	8.95		112	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	9.56	1.8	ng/L	8.95		107	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	8.54	1.8	ng/L	8.19		104	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	9.58	1.8	ng/L	8.95		107	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	10.0	1.8	ng/L	8.95		112	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	10.9	1.8	ng/L	8.50		128	64-140			
Perfluoropentanesulfonic acid (PFPeS)	9.28	1.8	ng/L	8.41		110	71-127			
Perfluoroundecanoic acid (PFUnA)	10.4	1.8	ng/L	8.95		116	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.65	1.8	ng/L	8.95		108	58.5-143			
Perfluoroheptanoic acid (PFHpA)	9.65	1.8	ng/L	8.95		108	72-130			
Perfluorooctanoic acid (PFOA)	10.9	1.8	ng/L	8.95		122	71-133			
Perfluorooctanesulfonic acid (PFOS)	8.67	1.8	ng/L	8.28		105	65-140			
Perfluorononanoic acid (PFNA)	10.2	1.8	ng/L	8.95		114	69-130			

LCS Dup (B331319-BSD1)

Prepared: 02/01/23 Analyzed: 02/14/23

Perfluorobutanoic acid (PFBA)	10.6	1.8	ng/L	8.87		120	73-129	5.47	30	
Perfluorobutanesulfonic acid (PFBS)	9.12	1.8	ng/L	7.85		116	72-130	5.34	30	
Perfluoropentanoic acid (PFPeA)	10.5	1.8	ng/L	8.87		118	72-129	5.48	30	
Perfluorohexanoic acid (PFHxA)	10.4	1.8	ng/L	8.87		118	72-129	4.62	30	
11Cl-PF3OUdS (F53B Major)	8.48	1.8	ng/L	8.36		102	55.1-141	15.2	30	
9Cl-PF3ONS (F53B Minor)	8.31	1.8	ng/L	8.27		100	59.6-146	6.22	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.34	1.8	ng/L	8.36		112	60.3-131	4.98	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.93	1.8	ng/L	8.87		101	37.6-167	4.01	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.37	1.8	ng/L	8.52		110	67-138	1.20	30	
Perfluorodecanoic acid (PFDA)	10.6	1.8	ng/L	8.87		119	71-129	1.01	30	
Perfluorododecanoic acid (PFDoA)	11.0	1.8	ng/L	8.87		125	72-134	3.27	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	9.06	1.8	ng/L	7.90		115	49.4-154	4.16	30	
Perfluoroheptanesulfonic acid (PFHpS)	10.9	1.8	ng/L	8.47		128	69-134	2.01	30	
N-EtFOSAA (NEtFOSAA)	11.3	1.8	ng/L	8.87		127	61-135	2.68	30	
N-MeFOSAA (NMeFOSAA)	11.5	1.8	ng/L	8.87		129	65-136	3.57	30	
Perfluorotetradecanoic acid (PFTA)	10.6	1.8	ng/L	8.87		120	71-132	1.87	30	
Perfluorotridecanoic acid (PFTTrDA)	10.9	1.8	ng/L	8.87		123	65-144	5.15	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.61	1.8	ng/L	8.30		116	63-143	4.24	30	
Perfluorodecanesulfonic acid (PFDS)	8.76	1.8	ng/L	8.56		102	53-142	10.3	30	
Perfluorooctanesulfonamide (FOSA)	10.6	1.8	ng/L	8.87		120	67-137	0.0232	30	
Perfluorononanesulfonic acid (PFNS)	10.2	1.8	ng/L	8.52		120	69-127	12.0	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	10.9	1.8	ng/L	8.87		123	61.7-156	8.25	30	
Perfluoro-1-butanefulfonamide (FBSA)	10.0	1.8	ng/L	8.87		113	61.3-145	4.92	30	
Perfluorohexanesulfonic acid (PFHxS)	9.01	1.8	ng/L	8.12		111	68-131	5.32	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	10.1	1.8	ng/L	8.87		114	59.8-147	5.50	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	10.6	1.8	ng/L	8.87		120	59.5-146	5.47	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

Batch B331319 - SOP 454-PFAAS
LCS Dup (B331319-BSD1)

Prepared: 02/01/23 Analyzed: 02/14/23

6:2 Fluorotelomersulfonic acid (6:2FTS A)	11.5	1.8	ng/L	8.43		136	64-140	5.67	30	
Perfluoropetanesulfonic acid (PFPeS)	9.48	1.8	ng/L	8.34		114	71-127	2.08	30	
Perfluoroundecanoic acid (PFUnA)	11.4	1.8	ng/L	8.87		128	69-133	9.42	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.5	1.8	ng/L	8.87		118	58.5-143	8.42	30	
Perfluoroheptanoic acid (PFHpA)	10.1	1.8	ng/L	8.87		114	72-130	5.02	30	
Perfluorooctanoic acid (PFOA)	10.6	1.8	ng/L	8.87		119	71-133	3.21	30	
Perfluorooctanesulfonic acid (PFOS)	10.1	1.8	ng/L	8.21		123	65-140	15.3	30	
Perfluorononanoic acid (PFNA)	10.8	1.8	ng/L	8.87		122	69-130	6.09	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 interference.
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	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.
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) (23A1761-01) Lab File ID: 23A1761-01.d Analyzed: 01/27/23 20:56									
M8FOSA	506838.1	4.0765	526,805.00	4.0765	96	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	97819.18	2.636633	170,638.00	2.636633	57	50 - 150	0.0000	+/-0.50	
M2PFTA	1111155	4.378417	1,086,833.00	4.378417	102	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	207325.7	3.850933	161,812.00	3.858883	128	50 - 150	-0.0080	+/-0.50	
MPFBA	671487.8	1.13325	521,416.00	1.12495	129	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	157867.4	2.954083	94,354.00	2.954083	167	50 - 150	0.0000	+/-0.50	*
M6PFDA	994120.1	3.859383	863,001.00	3.859383	115	50 - 150	0.0000	+/-0.50	
M3PFBS	208123.3	2.019367	160,738.00	2.019367	129	50 - 150	0.0000	+/-0.50	
M7PFUnA	1059711	4.001983	1,045,014.00	4.001983	101	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	84298.48	3.509617	106,935.00	3.509617	79	50 - 150	0.0000	+/-0.50	
M5PFPeA	560312.3	1.8328	443,162.00	1.824517	126	50 - 150	0.0083	+/-0.50	
M5PFHxA	991720.4	2.730867	791,300.00	2.722683	125	50 - 150	0.0082	+/-0.50	
M3PFHxS	189213.3	3.2923	153,295.00	3.2923	123	50 - 150	0.0000	+/-0.50	
M4PFHpA	1084074	3.25995	933,686.00	3.25995	116	50 - 150	0.0000	+/-0.50	
M8PFOA	1005150	3.51815	871,674.00	3.51815	115	50 - 150	0.0000	+/-0.50	
M8PFOS	183600.2	3.700067	164,066.00	3.700067	112	50 - 150	0.0000	+/-0.50	
M9PFNA	880295	3.709283	922,506.00	3.709283	95	50 - 150	0.0000	+/-0.50	
MPFDoA	962087.8	4.136817	979,361.00	4.14485	98	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	264607.9	4.009467	262,356.00	4.009467	101	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	281578.8	3.929883	282,370.00	3.937883	100	50 - 150	-0.0080	+/-0.50	
INF (PRW-4) (23A1761-01RE1) Lab File ID: 23A1761-01RE1.d Analyzed: 01/30/23 21:08									
M8PFOS	184852.8	3.7083	195,297.00	3.7083	95	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 (23A1761-02)		Lab File ID: 23A1761-02.d				Analyzed: 01/27/23 21:03			
M8FOSA	525677.2	4.0765	526,805.00	4.0765	100	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	87784.52	2.636633	170,638.00	2.636633	51	50 - 150	0.0000	+/-0.50	
M2PFTA	1162125	4.378417	1,086,833.00	4.378417	107	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	240618.4	3.850933	161,812.00	3.858883	149	50 - 150	-0.0080	+/-0.50	
MPFBA	700044.1	1.12495	521,416.00	1.12495	134	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	158851.5	2.954083	94,354.00	2.954083	168	50 - 150	0.0000	+/-0.50	*
M6PFDA	1039285	3.859383	863,001.00	3.859383	120	50 - 150	0.0000	+/-0.50	
M3PFBS	214709.2	2.019367	160,738.00	2.019367	134	50 - 150	0.0000	+/-0.50	
M7PFUnA	1213612	4.001983	1,045,014.00	4.001983	116	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	68380.02	3.509617	106,935.00	3.509617	64	50 - 150	0.0000	+/-0.50	
M5PFPeA	573998.1	1.8328	443,162.00	1.824517	130	50 - 150	0.0083	+/-0.50	
M5PFHxA	1006445	2.730867	791,300.00	2.722683	127	50 - 150	0.0082	+/-0.50	
M3PFHxS	190485.7	3.2923	153,295.00	3.2923	124	50 - 150	0.0000	+/-0.50	
M4PFHpA	1126972	3.25995	933,686.00	3.25995	121	50 - 150	0.0000	+/-0.50	
M8PFOA	1051157	3.52615	871,674.00	3.51815	121	50 - 150	0.0080	+/-0.50	
M8PFOS	191539.2	3.700067	164,066.00	3.700067	117	50 - 150	0.0000	+/-0.50	
M9PFNA	886470.3	3.709283	922,506.00	3.709283	96	50 - 150	0.0000	+/-0.50	
MPFDoA	1008680	4.136817	979,361.00	4.14485	103	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	267330.2	4.009467	262,356.00	4.009467	102	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	293563	3.929883	282,370.00	3.937883	104	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 (23A1761-03)		Lab File ID: 23A1761-03.d				Analyzed: 02/14/23 17:58			
M8FOSA	265396.4	3.932617	314,326.00	3.932617	84	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	57150.68	2.439333	108,885.00	2.431017	52	50 - 150	0.0083	+/-0.50	
M2PFTA	604623.5	4.27305	796,240.00	4.27305	76	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	99890.11	3.73905	137,156.00	3.73905	73	50 - 150	0.0000	+/-0.50	
MPFBA	392540.4	1.025233	413,208.00	1.025233	95	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	157579.8	2.773833	129,700.00	2.773833	121	50 - 150	0.0000	+/-0.50	
M6PFDA	578917.1	3.739567	658,650.00	3.739567	88	50 - 150	0.0000	+/-0.50	
M3PFBS	125139.8	1.845233	129,141.00	1.845233	97	50 - 150	0.0000	+/-0.50	
M7PFUnA	570406	3.889883	650,906.00	3.8899	88	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	53981.82	3.380233	76,313.00	3.38025	71	50 - 150	0.0000	+/-0.50	
M5PFPeA	394489.8	1.673467	402,212.00	1.6652	98	50 - 150	0.0083	+/-0.50	
M5PFHxA	576393.7	2.523067	588,515.00	2.523067	98	50 - 150	0.0000	+/-0.50	
M3PFHxS	89940.69	3.153433	93,895.00	3.153433	96	50 - 150	0.0000	+/-0.50	
M4PFHpA	592683.3	3.122317	630,699.00	3.113417	94	50 - 150	0.0089	+/-0.50	
M8PFOA	654405.1	3.397017	671,965.00	3.397017	97	50 - 150	0.0000	+/-0.50	
M8PFOS	87919.35	3.588267	91,012.00	3.588267	97	50 - 150	0.0000	+/-0.50	
M9PFNA	571919.1	3.5893	593,652.00	3.589317	96	50 - 150	0.0000	+/-0.50	
MPFDoA	494199.5	4.0247	603,394.00	4.0247	82	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	153144.4	3.897383	172,326.00	3.897383	89	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	202591.5	3.817433	228,323.00	3.817433	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
System #2 Mid (23A1761-04)		Lab File ID: 23A1761-04.d				Analyzed: 02/14/23 18:05			
M8FOSA	254766	3.932633	314,326.00	3.932617	81	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	50060.54	2.439333	108,885.00	2.431017	46	50 - 150	0.0083	+/-0.50	*
M2PFTA	639401	4.273067	796,240.00	4.27305	80	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	98011.32	3.73905	137,156.00	3.73905	71	50 - 150	0.0000	+/-0.50	
MPFBA	362141.9	1.025233	413,208.00	1.025233	88	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	132826.4	2.782017	129,700.00	2.773833	102	50 - 150	0.0082	+/-0.50	
M6PFDA	549615.3	3.739567	658,650.00	3.739567	83	50 - 150	0.0000	+/-0.50	
M3PFBS	118460.2	1.845233	129,141.00	1.845233	92	50 - 150	0.0000	+/-0.50	
M7PFUnA	553608.7	3.8899	650,906.00	3.8899	85	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	47420.27	3.380233	76,313.00	3.38025	62	50 - 150	0.0000	+/-0.50	
M5PFPeA	359350.3	1.673467	402,212.00	1.6652	89	50 - 150	0.0083	+/-0.50	
M5PFHxA	540864.8	2.523067	588,515.00	2.523067	92	50 - 150	0.0000	+/-0.50	
M3PFHxS	85461.94	3.153433	93,895.00	3.153433	91	50 - 150	0.0000	+/-0.50	
M4PFHpA	553487.6	3.122317	630,699.00	3.113417	88	50 - 150	0.0089	+/-0.50	
M8PFOA	631810.2	3.397017	671,965.00	3.397017	94	50 - 150	0.0000	+/-0.50	
M8PFOS	84245.8	3.588283	91,012.00	3.588267	93	50 - 150	0.0000	+/-0.50	
M9PFNA	538604.9	3.589317	593,652.00	3.589317	91	50 - 150	0.0000	+/-0.50	
MPFDoA	490477.2	4.024717	603,394.00	4.0247	81	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	147323.9	3.897383	172,326.00	3.897383	85	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	197801.1	3.81745	228,323.00	3.817433	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
System #2 Eff (23A1761-05)		Lab File ID: 23A1761-05.d				Analyzed: 01/27/23 21:10			
M8FOSA	460490.9	4.0765	526,805.00	4.0765	87	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	81166.29	2.636633	170,638.00	2.636633	48	50 - 150	0.0000	+/-0.50	*
M2PFTA	1221506	4.378417	1,086,833.00	4.378417	112	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	219991.1	3.850933	161,812.00	3.858883	136	50 - 150	-0.0080	+/-0.50	
MPFBA	593791.3	1.12495	521,416.00	1.12495	114	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	158476.8	2.954083	94,354.00	2.954083	168	50 - 150	0.0000	+/-0.50	*
M6PFDA	978389.3	3.859383	863,001.00	3.859383	113	50 - 150	0.0000	+/-0.50	
M3PFBS	206599	2.019367	160,738.00	2.019367	129	50 - 150	0.0000	+/-0.50	
M7PFUnA	1044803	4.001983	1,045,014.00	4.001983	100	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	68637.28	3.509617	106,935.00	3.509617	64	50 - 150	0.0000	+/-0.50	
M5PFPeA	508916.9	1.824517	443,162.00	1.824517	115	50 - 150	0.0000	+/-0.50	
M5PFHxA	932697.5	2.722683	791,300.00	2.722683	118	50 - 150	0.0000	+/-0.50	
M3PFHxS	186328.5	3.2923	153,295.00	3.2923	122	50 - 150	0.0000	+/-0.50	
M4PFHpA	1080496	3.25995	933,686.00	3.25995	116	50 - 150	0.0000	+/-0.50	
M8PFOA	999276.2	3.51815	871,674.00	3.51815	115	50 - 150	0.0000	+/-0.50	
M8PFOS	195119.4	3.700067	164,066.00	3.700067	119	50 - 150	0.0000	+/-0.50	
M9PFNA	858242.3	3.7011	922,506.00	3.709283	93	50 - 150	-0.0082	+/-0.50	
MPFDoA	1011442	4.136817	979,361.00	4.14485	103	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	262127.1	4.009467	262,356.00	4.009467	100	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	308875.5	3.929883	282,370.00	3.937883	109	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 (B329177-BLK1) Lab File ID: B329177-BLK1.d Analyzed: 01/27/23 18:24									
M8FOSA	479027.7	4.0765	526,805.00	4.0765	91	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	193088.3	2.636633	170,638.00	2.636633	113	50 - 150	0.0000	+/-0.50	
M2PFTA	1029810	4.378417	1,086,833.00	4.378417	95	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	247518.1	3.858883	161,812.00	3.858883	153	50 - 150	0.0000	+/-0.50	*
MPFBA	636530.8	1.12495	521,416.00	1.12495	122	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	153568.6	2.954083	94,354.00	2.954083	163	50 - 150	0.0000	+/-0.50	*
M6PFDA	906759.4	3.859383	863,001.00	3.859383	105	50 - 150	0.0000	+/-0.50	
M3PFBS	194384.3	2.019367	160,738.00	2.019367	121	50 - 150	0.0000	+/-0.50	
M7PFUnA	979597.9	4.001983	1,045,014.00	4.001983	94	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	112568.4	3.509617	106,935.00	3.509617	105	50 - 150	0.0000	+/-0.50	
M5PFPeA	534631.3	1.8328	443,162.00	1.824517	121	50 - 150	0.0083	+/-0.50	
M5PFHxA	916076.1	2.730867	791,300.00	2.722683	116	50 - 150	0.0082	+/-0.50	
M3PFHxS	183073	3.2923	153,295.00	3.2923	119	50 - 150	0.0000	+/-0.50	
M4PFHpA	1041855	3.25995	933,686.00	3.25995	112	50 - 150	0.0000	+/-0.50	
M8PFOA	958020.6	3.51815	871,674.00	3.51815	110	50 - 150	0.0000	+/-0.50	
M8PFOS	173716.8	3.700067	164,066.00	3.700067	106	50 - 150	0.0000	+/-0.50	
M9PFNA	822154.7	3.7011	922,506.00	3.709283	89	50 - 150	-0.0082	+/-0.50	
MPFDoA	874719.8	4.14485	979,361.00	4.14485	89	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	236197.6	4.009467	262,356.00	4.009467	90	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	289448.3	3.937883	282,370.00	3.937883	103	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 (B329177-BS1)		Lab File ID: B329177-BS1.d				Analyzed: 01/27/23 18:17			
M8FOSA	603665.9	4.0765	526,805.00	4.0765	115	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	226638.7	2.636633	170,638.00	2.636633	133	50 - 150	0.0000	+/-0.50	
M2PFTA	1223219	4.378417	1,086,833.00	4.378417	113	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	258974.9	3.858883	161,812.00	3.858883	160	50 - 150	0.0000	+/-0.50	*
MPFBA	773490.3	1.13325	521,416.00	1.12495	148	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	153234.7	2.954083	94,354.00	2.954083	162	50 - 150	0.0000	+/-0.50	*
M6PFDA	1162424	3.859383	863,001.00	3.859383	135	50 - 150	0.0000	+/-0.50	
M3PFBS	234070.3	2.019367	160,738.00	2.019367	146	50 - 150	0.0000	+/-0.50	
M7PFUnA	1255482	4.001983	1,045,014.00	4.001983	120	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	135886.9	3.509617	106,935.00	3.509617	127	50 - 150	0.0000	+/-0.50	
M5PFPeA	635210.9	1.8328	443,162.00	1.824517	143	50 - 150	0.0083	+/-0.50	
M5PFHxA	1133442	2.730867	791,300.00	2.722683	143	50 - 150	0.0082	+/-0.50	
M3PFHxS	215127.1	3.2923	153,295.00	3.2923	140	50 - 150	0.0000	+/-0.50	
M4PFHpA	1247006	3.25995	933,686.00	3.25995	134	50 - 150	0.0000	+/-0.50	
M8PFOA	1180298	3.51815	871,674.00	3.51815	135	50 - 150	0.0000	+/-0.50	
M8PFOS	221918.4	3.700067	164,066.00	3.700067	135	50 - 150	0.0000	+/-0.50	
M9PFNA	1006239	3.709283	922,506.00	3.709283	109	50 - 150	0.0000	+/-0.50	
MPFDoA	1148584	4.14485	979,361.00	4.14485	117	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	297620.8	4.009467	262,356.00	4.009467	113	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	377138.1	3.937883	282,370.00	3.937883	134	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 (B329177-MS2)		Lab File ID: B329177-MS2.d				Analyzed: 01/27/23 18:38			
M8FOSA	503497.7	4.0765	526,805.00	4.0765	96	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	98193.55	2.636633	170,638.00	2.636633	58	50 - 150	0.0000	+/-0.50	
M2PFTA	1009304	4.378417	1,086,833.00	4.378417	93	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	252724.2	3.850933	161,812.00	3.858883	156	50 - 150	-0.0080	+/-0.50	*
MPFBA	669951.5	1.13325	521,416.00	1.12495	128	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	170103.1	2.954083	94,354.00	2.954083	180	50 - 150	0.0000	+/-0.50	*
M6PFDA	966541.8	3.859383	863,001.00	3.859383	112	50 - 150	0.0000	+/-0.50	
M3PFBS	201523.3	2.019367	160,738.00	2.019367	125	50 - 150	0.0000	+/-0.50	
M7PFUnA	966766.1	4.001983	1,045,014.00	4.001983	93	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	69211.2	3.509617	106,935.00	3.509617	65	50 - 150	0.0000	+/-0.50	
M5PFPeA	556785.3	1.8328	443,162.00	1.824517	126	50 - 150	0.0083	+/-0.50	
M5PFHxA	960922.4	2.730867	791,300.00	2.722683	121	50 - 150	0.0082	+/-0.50	
M3PFHxS	177388.8	3.2923	153,295.00	3.2923	116	50 - 150	0.0000	+/-0.50	
M4PFHpA	1033334	3.25995	933,686.00	3.25995	111	50 - 150	0.0000	+/-0.50	
M8PFOA	976340.8	3.52615	871,674.00	3.51815	112	50 - 150	0.0080	+/-0.50	
M8PFOS	172615.9	3.700067	164,066.00	3.700067	105	50 - 150	0.0000	+/-0.50	
M9PFNA	833647.3	3.7011	922,506.00	3.709283	90	50 - 150	-0.0082	+/-0.50	
MPFDoA	927221.8	4.14485	979,361.00	4.14485	95	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	248381.3	4.009467	262,356.00	4.009467	95	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	278482.1	3.937883	282,370.00	3.937883	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
Matrix Spike Dup (B329177-MSD2)			Lab File ID: B329177-MSD2.d			Analyzed: 01/27/23 18:53			
M8FOSA	592760.4	4.0765	526,805.00	4.0765	113	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	112720.8	2.636633	170,638.00	2.636633	66	50 - 150	0.0000	+/-0.50	
M2PFTA	1235107	4.378417	1,086,833.00	4.378417	114	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	264769	3.850933	161,812.00	3.858883	164	50 - 150	-0.0080	+/-0.50	*
MPFBA	779976.3	1.13325	521,416.00	1.12495	150	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	156254.3	2.954083	94,354.00	2.954083	166	50 - 150	0.0000	+/-0.50	*
M6PFDA	1140671	3.859383	863,001.00	3.859383	132	50 - 150	0.0000	+/-0.50	
M3PFBS	240725.3	2.019367	160,738.00	2.019367	150	50 - 150	0.0000	+/-0.50	
M7PFUnA	1233035	4.001983	1,045,014.00	4.001983	118	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	86191.57	3.509617	106,935.00	3.509617	81	50 - 150	0.0000	+/-0.50	
M5PFPeA	653316.4	1.8328	443,162.00	1.824517	147	50 - 150	0.0083	+/-0.50	
M5PFHxA	1141341	2.730867	791,300.00	2.722683	144	50 - 150	0.0082	+/-0.50	
M3PFHxS	213194.8	3.2923	153,295.00	3.2923	139	50 - 150	0.0000	+/-0.50	
M4PFHpA	1231111	3.25995	933,686.00	3.25995	132	50 - 150	0.0000	+/-0.50	
M8PFOA	1131876	3.51815	871,674.00	3.51815	130	50 - 150	0.0000	+/-0.50	
M8PFOS	222133.4	3.700067	164,066.00	3.700067	135	50 - 150	0.0000	+/-0.50	
M9PFNA	1012642	3.709283	922,506.00	3.709283	110	50 - 150	0.0000	+/-0.50	
MPFDoA	1074382	4.14485	979,361.00	4.14485	110	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	295895.5	4.009467	262,356.00	4.009467	113	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	352300.6	3.937883	282,370.00	3.937883	125	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 (B331319-BLK1)			Lab File ID: B331319-BLK1.d			Analyzed: 02/14/23 17:51			
M8FOSA	284607	3.932633	314,326.00	3.932617	91	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	100235.3	2.439333	108,885.00	2.431017	92	50 - 150	0.0083	+/-0.50	
M2PFTA	653995.1	4.273067	796,240.00	4.27305	82	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	120813.1	3.739067	137,156.00	3.73905	88	50 - 150	0.0000	+/-0.50	
MPFBA	433100.9	1.025233	413,208.00	1.025233	105	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	150732.3	2.782033	129,700.00	2.773833	116	50 - 150	0.0082	+/-0.50	
M6PFDA	641425.3	3.739583	658,650.00	3.739567	97	50 - 150	0.0000	+/-0.50	
M3PFBS	139835.6	1.84525	129,141.00	1.845233	108	50 - 150	0.0000	+/-0.50	
M7PFUnA	625894.5	3.8899	650,906.00	3.8899	96	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	79500.65	3.380267	76,313.00	3.38025	104	50 - 150	0.0000	+/-0.50	
M5PFPeA	429450.4	1.673483	402,212.00	1.6652	107	50 - 150	0.0083	+/-0.50	
M5PFHxA	648807.1	2.523067	588,515.00	2.523067	110	50 - 150	0.0000	+/-0.50	
M3PFHxS	98054.48	3.15345	93,895.00	3.153433	104	50 - 150	0.0000	+/-0.50	
M4PFHpA	678302.1	3.12235	630,699.00	3.113417	108	50 - 150	0.0089	+/-0.50	
M8PFOA	736192.5	3.397033	671,965.00	3.397017	110	50 - 150	0.0000	+/-0.50	
M8PFOS	94134.7	3.588283	91,012.00	3.588267	103	50 - 150	0.0000	+/-0.50	
M9PFNA	650259.1	3.589333	593,652.00	3.589317	110	50 - 150	0.0000	+/-0.50	
MPFDoA	533454.4	4.024717	603,394.00	4.0247	88	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	173090.3	3.8974	172,326.00	3.897383	100	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	214553.1	3.81745	228,323.00	3.817433	94	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 (B331319-BS1)		Lab File ID: B331319-BS1.d			Analyzed: 02/14/23 17:36				
M8FOSA	237917.5	3.932617	314,326.00	3.932617	76	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	83706.87	2.439333	108,885.00	2.431017	77	50 - 150	0.0083	+/-0.50	
M2PFTA	536417.1	4.264917	796,240.00	4.27305	67	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	95420.5	3.73905	137,156.00	3.73905	70	50 - 150	0.0000	+/-0.50	
MPFBA	353858.8	1.025233	413,208.00	1.025233	86	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	135897	2.782017	129,700.00	2.773833	105	50 - 150	0.0082	+/-0.50	
M6PFDA	519260.3	3.739583	658,650.00	3.739567	79	50 - 150	0.0000	+/-0.50	
M3PFBS	112506.7	1.845233	129,141.00	1.845233	87	50 - 150	0.0000	+/-0.50	
M7PFUnA	502268.8	3.8899	650,906.00	3.8899	77	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	66487.28	3.38025	76,313.00	3.38025	87	50 - 150	0.0000	+/-0.50	
M5PFPeA	352008.9	1.673467	402,212.00	1.6652	88	50 - 150	0.0083	+/-0.50	
M5PFHxA	525035.8	2.523067	588,515.00	2.523067	89	50 - 150	0.0000	+/-0.50	
M3PFHxS	81390.02	3.153433	93,895.00	3.153433	87	50 - 150	0.0000	+/-0.50	
M4PFHpA	552600.4	3.122317	630,699.00	3.113417	88	50 - 150	0.0089	+/-0.50	
M8PFOA	595589.6	3.397033	671,965.00	3.397017	89	50 - 150	0.0000	+/-0.50	
M8PFOS	75529.79	3.588283	91,012.00	3.588267	83	50 - 150	0.0000	+/-0.50	
M9PFNA	514418.2	3.589317	593,652.00	3.589317	87	50 - 150	0.0000	+/-0.50	
MPFDoA	435388.6	4.0247	603,394.00	4.0247	72	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	131150.6	3.897383	172,326.00	3.897383	76	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	186307.3	3.81745	228,323.00	3.817433	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
LCS Dup (B331319-BSD1)		Lab File ID: B331319-BSD1.d				Analyzed: 02/14/23 17:44			
M8FOSA	237984.5	3.932633	314,326.00	3.932617	76	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	85788.15	2.431017	108,885.00	2.431017	79	50 - 150	0.0000	+/-0.50	
M2PFTA	629444.2	4.273067	796,240.00	4.27305	79	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	106459.2	3.739067	137,156.00	3.73905	78	50 - 150	0.0000	+/-0.50	
MPFBA	362499.4	1.025233	413,208.00	1.025233	88	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	149082.3	2.77385	129,700.00	2.773833	115	50 - 150	0.0000	+/-0.50	
M6PFDA	550592	3.739583	658,650.00	3.739567	84	50 - 150	0.0000	+/-0.50	
M3PFBS	114648.1	1.845233	129,141.00	1.845233	89	50 - 150	0.0000	+/-0.50	
M7PFUnA	516777.7	3.8899	650,906.00	3.8899	79	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	63834.47	3.38025	76,313.00	3.38025	84	50 - 150	0.0000	+/-0.50	
M5PFPeA	359394	1.673467	402,212.00	1.6652	89	50 - 150	0.0083	+/-0.50	
M5PFHxA	534995.7	2.523067	588,515.00	2.523067	91	50 - 150	0.0000	+/-0.50	
M3PFHxS	83703.87	3.15345	93,895.00	3.153433	89	50 - 150	0.0000	+/-0.50	
M4PFHpA	557646.5	3.113433	630,699.00	3.113417	88	50 - 150	0.0000	+/-0.50	
M8PFOA	624658.3	3.397033	671,965.00	3.397017	93	50 - 150	0.0000	+/-0.50	
M8PFOS	76256.55	3.588283	91,012.00	3.588267	84	50 - 150	0.0000	+/-0.50	
M9PFNA	524132.3	3.589317	593,652.00	3.589317	88	50 - 150	0.0000	+/-0.50	
MPFDoA	474441.8	4.024717	603,394.00	4.0247	79	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	145125.8	3.8974	172,326.00	3.897383	84	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	195269.6	3.81745	228,323.00	3.817433	86	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
Perfluorobutanesulfonic acid (PFBS)	NH-P
Perfluoropentanoic acid (PFPeA)	NH-P
Perfluorohexanoic acid (PFHxA)	NH-P
11Cl-PF3OUdS (F53B Major)	NH-P
9Cl-PF3ONS (F53B Minor)	NH-P
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P
Perfluorodecanoic acid (PFDA)	NH-P
Perfluorododecanoic acid (PFDoA)	NH-P
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P
Perfluoroheptanesulfonic acid (PFHpS)	NH-P
N-EtFOSAA (NEtFOSAA)	NH-P
N-MeFOSAA (NMeFOSAA)	NH-P
Perfluorotetradecanoic acid (PFTA)	NH-P
Perfluorotridecanoic acid (PFTrDA)	NH-P
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P
Perfluorodecanesulfonic acid (PFDS)	NH-P
Perfluorooctanesulfonamide (FOSA)	NH-P
Perfluorononanesulfonic acid (PFNS)	NH-P
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P
Perfluoro-1-butanedisulfonamide (FBSA)	NH-P
Perfluorohexanesulfonic acid (PFHxS)	NH-P
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P
Perfluoropentanesulfonic acid (PFPeS)	NH-P
Perfluoroundecanoic acid (PFUnA)	NH-P
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P
Perfluoroheptanoic acid (PFHpA)	NH-P
Perfluorooctanoic acid (PFOA)	NH-P
Perfluorooctanesulfonic acid (PFOS)	NH-P
Perfluorononanoic acid (PFNA)	NH-P

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



Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com

Barnstable County
3195 Main St. PO Box 427

Project Name: BFTA
Project Location: Barnstable, MA
Project Number: 6206
Project Manager: Roger Thibault

Con-Test Quote Name/Number:
Invoice Recipient: Priscilla Ellis - pellis@barnstablecounty.org
Sampled By: Matt Alger

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01078

Doc # 381 Rev 2_06/26/2019

Page 1 of 1

ANALYSIS REQUESTED

Con-Test Work Order #	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	Matrix Code	Conc Code	Data Delivery				PCB ONLY				PFAS	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)
							VIALS	GLASS	PLASTIC	BACTERIA	ENCORE	VIALS	GLASS	PLASTIC							
1	INF (PRW-4)	1-16-23 12:50		GRAB	GW	U															
2	System #1 Mid	1-16-23 12:40		GRAB	GW	U															
3	System #1 Eff	1-16-23 12:30		GRAB	GW	U															
4	System #2 Mid	1-16-23 12:15		GRAB	GW	U															
5	System #2 Eff	1-16-23 12:20		GRAB	GW	U															
6	System #1 Mid MS/MSD*	1-16-23 12:40		GRAB	GW	U															
Client Comments: *Lab requested MS/MSD. Sample confirmation and report to Rthibault@BETA-inc.com & Lboulouy@BETA-inc.com																					
Relinquished by (signature) <i>[Signature]</i>	Date/Time: 1-16-23 1630																				
Received by (signature) <i>[Signature]</i>	Date/Time: 1-16-23 1630																				
Relinquished by (signature) <i>[Signature]</i>	Date/Time: 1-16-23 1630																				
Received by (signature) <i>[Signature]</i>	Date/Time: 1-16-23 1634																				
Relinquished by (signature) <i>[Signature]</i>	Date/Time: 1-16-23 1433																				
Received by (signature) <i>[Signature]</i>	Date/Time: 1-16-23 1450																				
Relinquished by (signature) <i>[Signature]</i>	Date/Time: 1-16-23 1655																				
Received by (signature) <i>[Signature]</i>	Date/Time: 1-16-23 1655																				
Lab Comments:																					

Special Requirements

MA MCP Required ☐ MA MCP Certification Form Required ☐

CT RCP Required ☐ RCP Certification Form Required ☐

MA State DW Required ☐

Project Entity: Government ☐ Federal ☐ City ☐

Municipality: 21 J ☐ Brownfield ☐

Other: WRTA ☐ MWRA ☐ School ☐ MBTA ☐

Chromatogram ☐ AIHA-LAP, LLC ☐

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

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.

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.pacelabs.com

ENV-FRM-ELON-0001 v02__Sample Receiving Checklist 1-12-2023

Log In Back-Sheet

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



Client Barnstable County
Project BETA
MCP/RCP Required no
Deliverable Package Requirement none
Location Barnstable, Ma
PWSID# (When Applicable) n/a
Arrival Method Corporate Courier
Received By / Date / Time McM 1/18/23 1655
Back-Sheet By / Date / Time McM 1/18/23 1910
Temperature Method GUN # 5
Temp < 6°C ☒ Actual Temperature 58
Rush Samples: Yes / No No Notify
Short Hold: Yes / No No Notify

	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> ☐	☐

Notes regarding Samples/COC outside of SOP:

Container (Circle when applicable)	UnP	HCl	HNO3	H2SO4	NaOH	Trizma	Na2S2O3	Other Preservative
1L Amber Plastic								
500 mL Amber Plastic								
250 mL Amber <u>Plastic</u>	<u>12</u>							
Other Amber Clear Plastic								
16oz Amber Clear								
8oz Amber Clear								
4oz Amber Clear								
2oz Amber Clear								
Col/Bacteria								
Flashpoint								
Plastic Bag								
SOC Kit								
Perchlorate								
Encore								
Frozen								
Proper Headspace	UnP	HCl	MeOH	Bisulfate	DI	Thiosulfate	Sulfuric	Other
Vials								

March 20, 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: 23B1570

Enclosed are results of analyses for samples as received by the laboratory on February 14, 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: 3/20/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23B1570

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
SYS-1 MID PT	23B1570-01	Ground Water		SOP-454 PFAS	
SYS #1 EFF	23B1570-02	Ground Water		SOP-454 PFAS	
SYS 2 MID FT	23B1570-03	Ground Water		SOP-454 PFAS	
INF PRW-4	23B1570-04	Ground Water		SOP-454 PFAS	
SYS 2 EFF	23B1570-05	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:

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)

23B1570-02RE1[SYS #1 EFF], B332915-BLK1, B332915-BS1

D-01

Sample extracted/prepared at a dilution due to sample matrix interference.

Analyte & Samples(s) Qualified:

23B1570-01RE2[SYS-1 MID PT], 23B1570-03RE2[SYS 2 MID FT], 23B1570-04RE2[INF PRW-4], 23B1570-05RE2[SYS 2 EFF], B333470-MS1, B333470-MSD1

L-03

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

Analyte & Samples(s) Qualified:

Perfluorodecanoic acid (PFDA)

23B1570-01RE2[SYS-1 MID PT], 23B1570-03RE2[SYS 2 MID FT], 23B1570-04RE2[INF PRW-4], 23B1570-05RE2[SYS 2 EFF], B333470-BS1

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:

Perfluoroundecanoic acid (PFUnA)

B333470-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:

Perfluorohexanesulfonic acid (PFHxS)

B333470-MSD1

Perfluorooctanesulfonic acid (PFOS)

B333470-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:

M2-8:2FTS

23B1570-02RE1[SYS #1 EFF], B332915-BLK1

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:

M2-4:2FTS

23B1570-01RE2[SYS-1 MID PT], 23B1570-03RE2[SYS 2 MID FT], 23B1570-05RE2[SYS 2 EFF]

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: 23B1570

Date Received: 2/14/2023

Field Sample #: SYS-1 MID PT

Sampled: 2/10/2023 14:00

Sample ID: 23B1570-01

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)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluoropentanoic acid (PFPeA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorohexanoic acid (PFHxA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1	L-03	SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorotridecanoic acid (PFTTrDA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluoroundecanoic acid (PFUnA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluoroheptanoic acid (PFHpA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorooctanoic acid (PFOA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorooctanesulfonic acid (PFOS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB
Perfluorononanoic acid (PFNA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 12:54	RRB

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B1570

Date Received: 2/14/2023

Field Sample #: SYS #1 EFF

Sampled: 2/10/2023 13:45

Sample ID: 23B1570-02

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	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluoropentanoic acid (PFPeA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorohexanoic acid (PFHxA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorotridecanoic acid (PFTTrDA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluoro-1-butanesulfonamide (FBSA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	11	10	ng/L	1	B	SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluoroundecanoic acid (PFUnA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluoroheptanoic acid (PFHpA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorooctanoic acid (PFOA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorooctanesulfonic acid (PFOS)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB
Perfluorononanoic acid (PFNA)	ND	10	ng/L	1		SOP-454 PFAS	3/2/23	3/6/23 23:20	RRB

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B1570

Date Received: 2/14/2023

Field Sample #: SYS 2 MID FT

Sampled: 2/10/2023 14:15

Sample ID: 23B1570-03

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)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluoropentanoic acid (PFPeA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorohexanoic acid (PFHxA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1	L-03	SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorotridecanoic acid (PFTTrDA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorohexanesulfonic acid (PFHxS)	11	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluoroundecanoic acid (PFUnA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluoroheptanoic acid (PFHpA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorooctanoic acid (PFOA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorooctanesulfonic acid (PFOS)	39	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB
Perfluorononanoic acid (PFNA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:01	RRB

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B1570

Date Received: 2/14/2023

Field Sample #: INF PRW-4

Sampled: 2/10/2023 14:10

Sample ID: 23B1570-04

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)	22	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluoropentanoic acid (PFPeA)	73	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorohexanoic acid (PFHxA)	64	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	31	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1	L-03	SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorotridecanoic acid (PFTTrDA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	45	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluoro-1-butanefulfonamide (FBFA)	11	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorohexanesulfonic acid (PFHxS)	110	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	72	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluoropentanesulfonic acid (PFPeS)	12	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluoroundecanoic acid (PFUnA)	22	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluoroheptanoic acid (PFHpA)	39	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorooctanoic acid (PFOA)	21	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorooctanesulfonic acid (PFOS)	370	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB
Perfluorononanoic acid (PFNA)	14	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:08	RRB

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B1570

Date Received: 2/14/2023

Field Sample #: SYS 2 EFF

Sampled: 2/10/2023 14:15

Sample ID: 23B1570-05

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	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluoropentanoic acid (PFPeA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorohexanoic acid (PFHxA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1	L-03	SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorotridecanoic acid (PFTTrDA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluoroundecanoic acid (PFUnA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluoroheptanoic acid (PFHpA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorooctanoic acid (PFOA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorooctanesulfonic acid (PFOS)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB
Perfluorononanoic acid (PFNA)	ND	10	ng/L	1		SOP-454 PFAS	3/8/23	3/13/23 13:16	RRB

Sample Extraction Data**Prep Method: SOP 454-PFAAS Analytical Method: SOP-454 PFAS**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23B1570-02RE1 [SYS #1 EFF]	B332915	48.2	1.00	03/02/23

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23B1570-01RE2 [SYS-1 MID PT]	B333470	48.6	1.00	03/08/23
23B1570-03RE2 [SYS 2 MID FT]	B333470	48.3	1.00	03/08/23
23B1570-04RE2 [INF PRW-4]	B333470	48.1	1.00	03/08/23
23B1570-05RE2 [SYS 2 EFF]	B333470	48.1	1.00	03/08/23

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

Batch B332915 - SOP 454-PFAAS
Blank (B332915-BLK1)

Prepared: 03/02/23 Analyzed: 03/06/23

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)	5.5	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

B

LCS (B332915-BS1)

Prepared: 03/02/23 Analyzed: 03/06/23

Perfluorobutanoic acid (PFBA)	9.38	1.9	ng/L	9.35	100	73-129
Perfluorobutanesulfonic acid (PFBS)	8.07	1.9	ng/L	8.27	97.5	72-130
Perfluoropentanoic acid (PFPeA)	9.27	1.9	ng/L	9.35	99.2	72-129
Perfluorohexanoic acid (PFHxA)	9.44	1.9	ng/L	9.35	101	72-129
11Cl-PF3OUdS (F53B Major)	7.91	1.9	ng/L	8.81	89.9	55.1-141
9Cl-PF3ONS (F53B Minor)	8.14	1.9	ng/L	8.71	93.4	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.14	1.9	ng/L	8.81	104	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.64	1.9	ng/L	9.35	92.5	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.3	1.9	ng/L	8.97	114	67-138
Perfluorodecanoic acid (PFDA)	9.19	1.9	ng/L	9.35	98.3	71-129
Perfluorododecanoic acid (PFDoA)	9.06	1.9	ng/L	9.35	96.9	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	9.31	1.9	ng/L	8.32	112	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

Batch B332915 - SOP 454-PFAAS
LCS (B332915-BS1)

Prepared: 03/02/23 Analyzed: 03/06/23

Perfluoroheptanesulfonic acid (PFHpS)	9.27	1.9	ng/L	8.93		104	69-134			
N-EtFOSAA (NEtFOSAA)	10.8	1.9	ng/L	9.35		115	61-135			
N-MeFOSAA (NMeFOSAA)	11.1	1.9	ng/L	9.35		119	65-136			
Perfluorotetradecanoic acid (PFTA)	9.55	1.9	ng/L	9.35		102	71-132			
Perfluorotridecanoic acid (PFTrDA)	9.28	1.9	ng/L	9.35		99.3	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.41	1.9	ng/L	8.74		96.3	63-143			
Perfluorodecanesulfonic acid (PFDS)	8.36	1.9	ng/L	9.02		92.7	53-142			
Perfluorooctanesulfonamide (FOSA)	9.20	1.9	ng/L	9.35		98.4	67-137			
Perfluorononanesulfonic acid (PFNS)	7.78	1.9	ng/L	8.97		86.7	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	10.9	1.9	ng/L	9.35		116	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	10.4	1.9	ng/L	9.35		112	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	8.15	1.9	ng/L	8.55		95.3	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	9.89	1.9	ng/L	9.35		106	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	10.5	1.9	ng/L	9.35		112	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12.4	1.9	ng/L	8.88		140	64-140			B
Perfluoropentanesulfonic acid (PFPeS)	8.29	1.9	ng/L	8.79		94.4	71-127			
Perfluoroundecanoic acid (PFUnA)	9.83	1.9	ng/L	9.35		105	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.6	1.9	ng/L	9.35		113	58.5-143			
Perfluoroheptanoic acid (PFHpA)	9.46	1.9	ng/L	9.35		101	72-130			
Perfluorooctanoic acid (PFOA)	8.66	1.9	ng/L	9.35		92.6	71-133			
Perfluorooctanesulfonic acid (PFOS)	8.80	1.9	ng/L	8.65		102	65-140			
Perfluorononanoic acid (PFNA)	9.53	1.9	ng/L	9.35		102	69-130			

Batch B333470 - SOP 454-PFAAS
Blank (B333470-BLK1)

Prepared: 03/08/23 Analyzed: 03/13/23

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 (FBSA)	ND	1.8	ng/L							
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	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

Batch B333470 - SOP 454-PFAAS
Blank (B333470-BLK1)

Prepared: 03/08/23 Analyzed: 03/13/23

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 (B333470-BS1)

Prepared: 03/08/23 Analyzed: 03/13/23

Perfluorobutanoic acid (PFBA)	7.15	1.8	ng/L	9.11	78.5	73-129
Perfluorobutanesulfonic acid (PFBS)	5.96	1.8	ng/L	8.07	73.9	72-130
Perfluoropentanoic acid (PFPeA)	6.85	1.8	ng/L	9.11	75.2	72-129
Perfluorohexanoic acid (PFHxA)	6.80	1.8	ng/L	9.11	74.6	72-129
11Cl-PF3OUdS (F53B Major)	5.54	1.8	ng/L	8.59	64.5	55.1-141
9Cl-PF3ONS (F53B Minor)	7.55	1.8	ng/L	8.49	88.9	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	6.64	1.8	ng/L	8.59	77.3	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.25	1.8	ng/L	9.11	90.6	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	6.61	1.8	ng/L	8.75	75.5	67-138
Perfluorodecanoic acid (PFDA)	6.34	1.8	ng/L	9.11	69.5	* 71-129
Perfluorododecanoic acid (PFDoA)	7.32	1.8	ng/L	9.11	80.3	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	6.63	1.8	ng/L	8.11	81.8	49.4-154
Perfluoroheptanesulfonic acid (PFHpS)	6.93	1.8	ng/L	8.70	79.6	69-134
N-EtFOSAA (NEtFOSAA)	7.23	1.8	ng/L	9.11	79.3	61-135
N-MeFOSAA (NMeFOSAA)	7.30	1.8	ng/L	9.11	80.1	65-136
Perfluorotetradecanoic acid (PFTA)	7.49	1.8	ng/L	9.11	82.2	71-132
Perfluorotridecanoic acid (PFTrDA)	7.09	1.8	ng/L	9.11	77.8	65-144
4:2 Fluorotelomersulfonic acid (4:2FTS A)	6.65	1.8	ng/L	8.52	78.0	63-143
Perfluorodecanesulfonic acid (PFDS)	5.40	1.8	ng/L	8.80	61.4	53-142
Perfluorooctanesulfonamide (FOSA)	7.20	1.8	ng/L	9.11	78.9	67-137
Perfluorononanesulfonic acid (PFNS)	6.61	1.8	ng/L	8.75	75.5	69-127
Perfluoro-1-hexanesulfonamide (FHxSA)	7.13	1.8	ng/L	9.11	78.2	61.7-156
Perfluoro-1-butanesulfonamide (FBSA)	7.67	1.8	ng/L	9.11	84.1	61.3-145
Perfluorohexanesulfonic acid (PFHxS)	6.57	1.8	ng/L	8.34	78.7	68-131
Perfluoro-4-oxapentanoic acid (PFMPA)	6.71	1.8	ng/L	9.11	73.6	59.8-147
Perfluoro-5-oxahexanoic acid (PFMBA)	7.33	1.8	ng/L	9.11	80.4	59.5-146
6:2 Fluorotelomersulfonic acid (6:2FTS A)	6.73	1.8	ng/L	8.66	77.7	64-140
Perfluoropentanesulfonic acid (PFPeS)	6.35	1.8	ng/L	8.57	74.1	71-127
Perfluoroundecanoic acid (PFUnA)	6.64	1.8	ng/L	9.11	72.9	69-133
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	6.67	1.8	ng/L	9.11	73.1	58.5-143
Perfluoroheptanoic acid (PFHpA)	6.99	1.8	ng/L	9.11	76.7	72-130
Perfluorooctanoic acid (PFOA)	7.17	1.8	ng/L	9.11	78.6	71-133
Perfluorooctanesulfonic acid (PFOS)	6.47	1.8	ng/L	8.43	76.8	65-140
Perfluorononanoic acid (PFNA)	6.85	1.8	ng/L	9.11	75.1	69-130

L-03

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 B333470 - SOP 454-PFAAS

Matrix Spike (B333470-MS1)	Source: 23B1570-01RE2			Prepared: 03/08/23 Analyzed: 03/13/23			D-01			
Perfluorobutanoic acid (PFBA)	42.4	10	ng/L	51.0	ND	83.2	73-129			
Perfluorobutanesulfonic acid (PFBS)	34.9	10	ng/L	45.2	ND	77.3	72-130			
Perfluoropentanoic acid (PFPeA)	41.7	10	ng/L	51.0	ND	81.6	72-129			
Perfluorohexanoic acid (PFHxA)	40.8	10	ng/L	51.0	ND	79.9	72-129			
11Cl-PF3OUdS (F53B Major)	31.9	10	ng/L	48.1	ND	66.4	58.3-140			
9Cl-PF3ONS (F53B Minor)	43.6	10	ng/L	47.6	ND	91.7	61.4-144			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	40.6	10	ng/L	48.1	ND	84.5	62.4-128			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	49.6	10	ng/L	51.0	ND	97.2	36.7-171			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	39.8	10	ng/L	49.0	ND	81.3	67-138			
Perfluorodecanoic acid (PFDA)	36.7	10	ng/L	51.0	ND	71.9	71-129			
Perfluorododecanoic acid (PFDoA)	39.8	10	ng/L	51.0	ND	78.0	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	39.0	10	ng/L	45.4	ND	85.9	54.3-149			
Perfluoroheptanesulfonic acid (PFHpS)	37.6	10	ng/L	48.7	ND	77.2	69-134			
N-EtFOSAA (NEtFOSAA)	42.2	10	ng/L	51.0	ND	82.7	61-135			
N-MeFOSAA (NMeFOSAA)	39.8	10	ng/L	51.0	ND	78.1	65-136			
Perfluorotetradecanoic acid (PFTA)	42.6	10	ng/L	51.0	ND	83.6	71-132			
Perfluorotridecanoic acid (PFTrDA)	42.3	10	ng/L	51.0	ND	82.8	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	38.2	10	ng/L	47.7	ND	80.0	63-143			
Perfluorodecanesulfonic acid (PFDS)	30.4	10	ng/L	49.2	ND	61.6	53-142			
Perfluorooctanesulfonamide (FOSA)	36.2	10	ng/L	51.0	ND	70.9	67-137			
Perfluorononanesulfonic acid (PFNS)	36.7	10	ng/L	49.0	ND	75.0	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	41.1	10	ng/L	51.0	ND	80.6	64.2-154			
Perfluoro-1-butanefulfonamide (FBSA)	43.9	10	ng/L	51.0	ND	86.1	65.9-140			
Perfluorohexanesulfonic acid (PFHxS)	38.0	10	ng/L	46.7	ND	81.4	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	39.6	10	ng/L	51.0	ND	77.6	61.9-143			
Perfluoro-5-oxahexanoic acid (PFMBA)	41.9	10	ng/L	51.0	ND	82.0	61.4-142			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	36.7	10	ng/L	48.5	ND	75.6	64-140			
Perfluoropentanesulfonic acid (PFPeS)	38.2	10	ng/L	48.0	ND	79.7	71-127			
Perfluoroundecanoic acid (PFUnA)	34.6	10	ng/L	51.0	ND	67.8	* 69-133			MS-22
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	38.3	10	ng/L	51.0	ND	75.1	62-138			
Perfluoroheptanoic acid (PFHpA)	41.6	10	ng/L	51.0	ND	81.6	72-130			
Perfluorooctanoic acid (PFOA)	41.7	10	ng/L	51.0	ND	81.8	71-133			
Perfluorooctanesulfonic acid (PFOS)	43.2	10	ng/L	47.2	6.42	78.0	65-140			
Perfluorononanoic acid (PFNA)	39.1	10	ng/L	51.0	ND	76.7	69-130			

Matrix Spike Dup (B333470-MSD1)	Source: 23B1570-01RE2			Prepared: 03/08/23 Analyzed: 03/13/23			D-01			
Perfluorobutanoic acid (PFBA)	41.6	10	ng/L	51.2	ND	81.2	73-129	2.04	30	
Perfluorobutanesulfonic acid (PFBS)	38.5	10	ng/L	45.3	ND	85.1	72-130	9.89	30	
Perfluoropentanoic acid (PFPeA)	42.2	10	ng/L	51.2	ND	82.4	72-129	1.17	30	
Perfluorohexanoic acid (PFHxA)	42.9	10	ng/L	51.2	ND	83.8	72-129	4.99	30	
11Cl-PF3OUdS (F53B Major)	31.6	10	ng/L	48.2	ND	65.6	58.3-140	0.930	30	
9Cl-PF3ONS (F53B Minor)	38.1	10	ng/L	47.7	ND	79.9	61.4-144	13.5	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	39.8	10	ng/L	48.2	ND	82.6	62.4-128	1.94	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	49.4	10	ng/L	51.2	ND	96.5	36.7-171	0.417	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	42.5	10	ng/L	49.1	ND	86.4	67-138	6.38	30	
Perfluorodecanoic acid (PFDA)	40.3	10	ng/L	51.2	ND	78.8	71-129	9.50	30	
Perfluorododecanoic acid (PFDoA)	40.6	10	ng/L	51.2	ND	79.3	72-134	1.86	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	39.3	10	ng/L	45.5	ND	86.3	54.3-149	0.759	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

Batch B333470 - SOP 454-PFAAS

Matrix Spike Dup (B333470-MSD1)		Source: 23B1570-01RE2			Prepared: 03/08/23 Analyzed: 03/13/23		D-01			
Perfluoroheptanesulfonic acid (PFHpS)	39.7	10	ng/L	48.9	ND	81.3	69-134	5.44	30	
N-EtFOSAA (NEtFOSAA)	42.4	10	ng/L	51.2	ND	82.9	61-135	0.564	30	
N-MeFOSAA (NMeFOSAA)	43.7	10	ng/L	51.2	ND	85.4	65-136	9.22	30	
Perfluorotetradecanoic acid (PFTA)	43.8	10	ng/L	51.2	ND	85.6	71-132	2.70	30	
Perfluorotridecanoic acid (PFTrDA)	42.4	10	ng/L	51.2	ND	82.9	65-144	0.405	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	38.1	10	ng/L	47.9	ND	79.6	63-143	0.164	30	
Perfluorodecanesulfonic acid (PFDS)	32.4	10	ng/L	49.4	ND	65.5	53-142	6.41	30	
Perfluorooctanesulfonamide (FOSA)	38.6	10	ng/L	51.2	ND	75.4	67-137	6.43	30	
Perfluorononanesulfonic acid (PFNS)	36.1	10	ng/L	49.1	ND	73.5	69-127	1.74	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	40.2	10	ng/L	51.2	ND	78.5	64.2-154	2.38	30	
Perfluoro-1-butanefulfonamide (FBSA)	45.5	10	ng/L	51.2	ND	88.9	65.9-140	3.50	30	
Perfluorohexanesulfonic acid (PFHxS)	69.8	10	ng/L	46.8	ND	149	* 68-131	59.0	* 30	MS-23
Perfluoro-4-oxapentanoic acid (PFMPA)	38.8	10	ng/L	51.2	ND	75.9	61.9-143	1.87	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	41.6	10	ng/L	51.2	ND	81.2	61.4-142	0.729	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	36.5	10	ng/L	48.6	ND	75.1	64-140	0.410	30	
Perfluoropentanesulfonic acid (PFPeS)	40.4	10	ng/L	48.1	ND	84.0	71-127	5.55	30	
Perfluoroundecanoic acid (PFUnA)	37.1	10	ng/L	51.2	ND	72.5	69-133	6.91	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	38.5	10	ng/L	51.2	ND	75.3	62-138	0.500	30	
Perfluoroheptanoic acid (PFHpA)	43.7	10	ng/L	51.2	ND	85.4	72-130	4.88	30	
Perfluorooctanoic acid (PFOA)	39.8	10	ng/L	51.2	ND	77.9	71-133	4.62	30	
Perfluorooctanesulfonic acid (PFOS)	73.5	10	ng/L	47.3	6.42	142	* 65-140	51.9	* 30	MS-23
Perfluorononanoic acid (PFNA)	43.4	10	ng/L	51.2	ND	84.9	69-130	10.4	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.
D-01	Sample extracted/prepared at a dilution due to sample matrix interference.
L-03	Laboratory fortified blank/laboratory control sample recovery is outside of control limits. Reported value for this compound is likely to be biased on the low side.
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.
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
SYS-1 MID PT (23B1570-01RE2)		Lab File ID: 23B1570-01RE2.d				Analyzed: 03/13/23 12:54			
M8FOSA	198569.2	4.00455	202,124.00	4.00455	98	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	35169.18	2.603583	70,921.00	2.6118	50	50 - 150	-0.0082	+/-0.50	
M2PFTA	500677.9	4.345917	484,398.00	4.345917	103	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	44752.48	3.810767	58,951.00	3.818733	76	50 - 150	-0.0080	+/-0.50	
MPFBA	240510.8	1.0917	234,256.00	1.0834	103	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	57551.75	2.91295	71,810.00	2.91295	80	50 - 150	0.0000	+/-0.50	
M6PFDA	399402.5	3.811283	342,979.00	3.81925	116	50 - 150	-0.0080	+/-0.50	
M3PFBS	82955.3	1.978033	75,822.00	1.978033	109	50 - 150	0.0000	+/-0.50	
M7PFUnA	412858.4	3.962017	409,442.00	3.962017	101	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	37647.45	3.4614	54,277.00	3.4614	69	50 - 150	0.0000	+/-0.50	
M5PFPeA	258251.9	1.79965	238,015.00	1.79965	109	50 - 150	0.0000	+/-0.50	
M5PFHxA	377277.6	2.696967	338,364.00	2.696967	112	50 - 150	0.0000	+/-0.50	
M3PFHxS	60292.92	3.242583	55,970.00	3.242583	108	50 - 150	0.0000	+/-0.50	
M4PFHpA	393602.8	3.21145	370,206.00	3.21145	106	50 - 150	0.0000	+/-0.50	
M8PFOA	433694.4	3.469917	407,582.00	3.4779	106	50 - 150	-0.0080	+/-0.50	
M8PFOS	64304.96	3.65215	60,566.00	3.660133	106	50 - 150	-0.0080	+/-0.50	
M9PFNA	442237.1	3.661167	421,439.00	3.661183	105	50 - 150	0.0000	+/-0.50	
MPFDoA	364513.1	4.104633	365,521.00	4.104633	100	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	115054.8	3.969483	119,169.00	3.969483	97	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	138302.9	3.889733	138,888.00	3.889733	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
SYS #1 EFF (23B1570-02RE1)		Lab File ID: 23B1570-02RE1.d				Analyzed: 03/06/23 23:20			
M8FOSA	352287.3	4.00455	293,047.00	4.00455	120	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	84970.64	2.562517	94,360.00	2.562517	90	50 - 150	0.0000	+/-0.50	
M2PFTA	774709.7	4.32155	668,110.00	4.32155	116	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	99821.66	3.794817	64,638.00	3.794817	154	50 - 150	0.0000	+/-0.50	*
MPFBA	479552.4	1.066783	359,507.00	1.066783	133	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	126552.9	2.880217	117,715.00	2.880217	108	50 - 150	0.0000	+/-0.50	
M6PFDA	711051.4	3.79535	524,174.00	3.79535	136	50 - 150	0.0000	+/-0.50	
M3PFBS	157846.3	1.944683	114,399.00	1.944683	138	50 - 150	0.0000	+/-0.50	
M7PFUnA	692616.4	3.938033	565,816.00	3.946033	122	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	76728.02	3.445283	64,592.00	3.445283	119	50 - 150	0.0000	+/-0.50	
M5PFPeA	498662.2	1.766017	360,526.00	1.757717	138	50 - 150	0.0083	+/-0.50	
M5PFHxA	712172.3	2.655	514,795.00	2.655	138	50 - 150	0.0000	+/-0.50	
M3PFHxS	123112.5	3.218333	87,064.00	3.218333	141	50 - 150	0.0000	+/-0.50	
M4PFHpA	771430.4	3.186933	532,836.00	3.186933	145	50 - 150	0.0000	+/-0.50	
M8PFOA	834027.4	3.453817	603,820.00	3.453817	138	50 - 150	0.0000	+/-0.50	
M8PFOS	126201.2	3.636183	88,915.00	3.636183	142	50 - 150	0.0000	+/-0.50	
M9PFNA	792756.8	3.637217	577,370.00	3.637217	137	50 - 150	0.0000	+/-0.50	
MPFDaA	590312.4	4.08065	538,649.00	4.08065	110	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	199714	3.9455	175,242.00	3.9535	114	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	235387.8	3.873767	191,478.00	3.873767	123	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 FT (23B1570-03RE2)		Lab File ID: 23B1570-03RE2.d				Analyzed: 03/13/23 13:01			
M8FOSA	167690.5	4.00455	202,124.00	4.00455	83	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	31410.57	2.603583	70,921.00	2.6118	44	50 - 150	-0.0082	+/-0.50	*
M2PFTA	308879.4	4.345917	484,398.00	4.345917	64	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	36204.73	3.810767	58,951.00	3.818733	61	50 - 150	-0.0080	+/-0.50	
MPFBA	224644.7	1.0834	234,256.00	1.0834	96	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	60114.49	2.91295	71,810.00	2.91295	84	50 - 150	0.0000	+/-0.50	
M6PFDA	348741.4	3.811283	342,979.00	3.81925	102	50 - 150	-0.0080	+/-0.50	
M3PFBS	78032.86	1.978033	75,822.00	1.978033	103	50 - 150	0.0000	+/-0.50	
M7PFUnA	305734.4	3.962017	409,442.00	3.962017	75	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	29980.39	3.4614	54,277.00	3.4614	55	50 - 150	0.0000	+/-0.50	
M5PFPeA	244614.5	1.791367	238,015.00	1.79965	103	50 - 150	-0.0083	+/-0.50	
M5PFHxA	355181.8	2.696967	338,364.00	2.696967	105	50 - 150	0.0000	+/-0.50	
M3PFHxS	57731.2	3.242583	55,970.00	3.242583	103	50 - 150	0.0000	+/-0.50	
M4PFHpA	384665.6	3.21145	370,206.00	3.21145	104	50 - 150	0.0000	+/-0.50	
M8PFOA	418136.7	3.469917	407,582.00	3.4779	103	50 - 150	-0.0080	+/-0.50	
M8PFOS	61072.98	3.65215	60,566.00	3.660133	101	50 - 150	-0.0080	+/-0.50	
M9PFNA	400693.7	3.661167	421,439.00	3.661183	95	50 - 150	0.0000	+/-0.50	
MPFDoA	210956.3	4.104633	365,521.00	4.104633	58	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	82282.79	3.969483	119,169.00	3.969483	69	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	114731.1	3.889733	138,888.00	3.889733	83	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
INF PRW-4 (23B1570-04RE2) Lab File ID: 23B1570-04RE2.d Analyzed: 03/13/23 13:08									
M8FOSA	181571.3	4.00455	202,124.00	4.00455	90	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	35910.97	2.603583	70,921.00	2.6118	51	50 - 150	-0.0082	+/-0.50	
M2PFTA	296553.3	4.3378	484,398.00	4.345917	61	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	41555.85	3.810767	58,951.00	3.818733	70	50 - 150	-0.0080	+/-0.50	
MPFBA	232930.3	1.0917	234,256.00	1.0834	99	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	66255.8	2.91295	71,810.00	2.91295	92	50 - 150	0.0000	+/-0.50	
M6PFDA	356290.1	3.811283	342,979.00	3.81925	104	50 - 150	-0.0080	+/-0.50	
M3PFBS	76401.77	1.978033	75,822.00	1.978033	101	50 - 150	0.0000	+/-0.50	
M7PFUnA	371439.3	3.962017	409,442.00	3.962017	91	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	37098.47	3.4614	54,277.00	3.4614	68	50 - 150	0.0000	+/-0.50	
M5PFPeA	258235.6	1.79965	238,015.00	1.79965	108	50 - 150	0.0000	+/-0.50	
M5PFHxA	372248.3	2.696967	338,364.00	2.696967	110	50 - 150	0.0000	+/-0.50	
M3PFHxS	54940.59	3.242583	55,970.00	3.242583	98	50 - 150	0.0000	+/-0.50	
M4PFHpA	399364.8	3.21145	370,206.00	3.21145	108	50 - 150	0.0000	+/-0.50	
M8PFOA	438213.8	3.469917	407,582.00	3.4779	108	50 - 150	-0.0080	+/-0.50	
M8PFOS	57216.21	3.65215	60,566.00	3.660133	94	50 - 150	-0.0080	+/-0.50	
M9PFNA	426161.2	3.661183	421,439.00	3.661183	101	50 - 150	0.0000	+/-0.50	
MPFDoA	289804.3	4.104633	365,521.00	4.104633	79	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	104576.9	3.969483	119,169.00	3.969483	88	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	139103	3.889733	138,888.00	3.889733	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
SYS 2 EFF (23B1570-05RE2) Lab File ID: 23B1570-05RE2.d Analyzed: 03/13/23 13:16									
M8FOSA	167400.3	4.00455	202,124.00	4.00455	83	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	28565.84	2.603583	70,921.00	2.6118	40	50 - 150	-0.0082	+/-0.50	*
M2PFTA	400034	4.3378	484,398.00	4.345917	83	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	35436.6	3.810767	58,951.00	3.818733	60	50 - 150	-0.0080	+/-0.50	
MPFBA	205975.6	1.0917	234,256.00	1.0834	88	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	66682.27	2.91295	71,810.00	2.91295	93	50 - 150	0.0000	+/-0.50	
M6PFDA	311857.6	3.811283	342,979.00	3.81925	91	50 - 150	-0.0080	+/-0.50	
M3PFBS	69197.56	1.978033	75,822.00	1.978033	91	50 - 150	0.0000	+/-0.50	
M7PFUnA	348739.8	3.962017	409,442.00	3.962017	85	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	27210.23	3.4614	54,277.00	3.4614	50	50 - 150	0.0000	+/-0.50	
M5PFPeA	219294.4	1.79965	238,015.00	1.79965	92	50 - 150	0.0000	+/-0.50	
M5PFHxA	320949	2.696967	338,364.00	2.696967	95	50 - 150	0.0000	+/-0.50	
M3PFHxS	52917.84	3.242583	55,970.00	3.242583	95	50 - 150	0.0000	+/-0.50	
M4PFHpA	347316.4	3.21145	370,206.00	3.21145	94	50 - 150	0.0000	+/-0.50	
M8PFOA	392714.8	3.469917	407,582.00	3.4779	96	50 - 150	-0.0080	+/-0.50	
M8PFOS	54903.65	3.65215	60,566.00	3.660133	91	50 - 150	-0.0080	+/-0.50	
M9PFNA	379621.3	3.653183	421,439.00	3.661183	90	50 - 150	-0.0080	+/-0.50	
MPFDoA	288367.7	4.096633	365,521.00	4.104633	79	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	97237.99	3.969483	119,169.00	3.969483	82	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	111359.1	3.889733	138,888.00	3.889733	80	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 (B332915-BLK1)			Lab File ID: B332915-BLK1.d			Analyzed: 03/06/23 22:37			
M8FOSA	333157.5	4.00455	293,047.00	4.00455	114	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	115088.4	2.562517	94,360.00	2.562517	122	50 - 150	0.0000	+/-0.50	
M2PFTA	780947.8	4.32155	668,110.00	4.32155	117	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	107063	3.794833	64,638.00	3.794817	166	50 - 150	0.0000	+/-0.50	*
MPFBA	465412.9	1.066783	359,507.00	1.066783	129	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	131716.4	2.880217	117,715.00	2.880217	112	50 - 150	0.0000	+/-0.50	
M6PFDA	684267.1	3.79535	524,174.00	3.79535	131	50 - 150	0.0000	+/-0.50	
M3PFBS	148923	1.944683	114,399.00	1.944683	130	50 - 150	0.0000	+/-0.50	
M7PFUnA	689815.1	3.938033	565,816.00	3.946033	122	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	85113.68	3.445283	64,592.00	3.445283	132	50 - 150	0.0000	+/-0.50	
M5PFPeA	479190.8	1.766017	360,526.00	1.757717	133	50 - 150	0.0083	+/-0.50	
M5PFHxA	677128.9	2.655	514,795.00	2.655	132	50 - 150	0.0000	+/-0.50	
M3PFHxS	112368.3	3.218333	87,064.00	3.218333	129	50 - 150	0.0000	+/-0.50	
M4PFHpA	710743.3	3.195017	532,836.00	3.186933	133	50 - 150	0.0081	+/-0.50	
M8PFOA	816049.6	3.453817	603,820.00	3.453817	135	50 - 150	0.0000	+/-0.50	
M8PFOS	109999.9	3.636183	88,915.00	3.636183	124	50 - 150	0.0000	+/-0.50	
M9PFNA	737795.6	3.637217	577,370.00	3.637217	128	50 - 150	0.0000	+/-0.50	
MPFDoA	596014.1	4.08065	538,649.00	4.08065	111	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	190095.9	3.945517	175,242.00	3.9535	108	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	244860.3	3.873767	191,478.00	3.873767	128	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 (B332915-BS1)			Lab File ID: B332915-BS1.d			Analyzed: 03/06/23 22:30			
M8FOSA	282276.3	4.00455	293,047.00	4.00455	96	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	97593.63	2.562517	94,360.00	2.562517	103	50 - 150	0.0000	+/-0.50	
M2PFTA	642745.6	4.32155	668,110.00	4.32155	96	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	86787.97	3.794833	64,638.00	3.794817	134	50 - 150	0.0000	+/-0.50	
MPFBA	381100.7	1.066783	359,507.00	1.066783	106	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	139588.5	2.880217	117,715.00	2.880217	119	50 - 150	0.0000	+/-0.50	
M6PFDA	564570.2	3.79535	524,174.00	3.79535	108	50 - 150	0.0000	+/-0.50	
M3PFBS	121482.9	1.944683	114,399.00	1.944683	106	50 - 150	0.0000	+/-0.50	
M7PFUnA	568861.6	3.946033	565,816.00	3.946033	101	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	75635.55	3.445283	64,592.00	3.445283	117	50 - 150	0.0000	+/-0.50	
M5PFPeA	393987	1.757717	360,526.00	1.757717	109	50 - 150	0.0000	+/-0.50	
M5PFHxA	554732.6	2.655	514,795.00	2.655	108	50 - 150	0.0000	+/-0.50	
M3PFHxS	93334.2	3.218333	87,064.00	3.218333	107	50 - 150	0.0000	+/-0.50	
M4PFHpA	595569.4	3.186933	532,836.00	3.186933	112	50 - 150	0.0000	+/-0.50	
M8PFOA	653395.3	3.453817	603,820.00	3.453817	108	50 - 150	0.0000	+/-0.50	
M8PFOS	91171.73	3.636183	88,915.00	3.636183	103	50 - 150	0.0000	+/-0.50	
M9PFNA	613901.8	3.637217	577,370.00	3.637217	106	50 - 150	0.0000	+/-0.50	
MPFDoA	492572	4.08065	538,649.00	4.08065	91	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	158174	3.945517	175,242.00	3.9535	90	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	195638.1	3.873767	191,478.00	3.873767	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
Blank (B333470-BLK1)			Lab File ID: B333470-BLK1.d			Analyzed: 03/13/23 12:18			
M8FOSA	169931.8	3.996567	202,124.00	4.00455	84	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	58126.42	2.603583	70,921.00	2.6118	82	50 - 150	-0.0082	+/-0.50	
M2PFTA	413605.8	4.3378	484,398.00	4.345917	85	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	52717.14	3.810767	58,951.00	3.818733	89	50 - 150	-0.0080	+/-0.50	
MPFBA	216887	1.0917	234,256.00	1.0834	93	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	56774.25	2.91295	71,810.00	2.91295	79	50 - 150	0.0000	+/-0.50	
M6PFDA	340076.1	3.811283	342,979.00	3.81925	99	50 - 150	-0.0080	+/-0.50	
M3PFBS	72655.39	1.978033	75,822.00	1.978033	96	50 - 150	0.0000	+/-0.50	
M7PFUnA	365091.6	3.962017	409,442.00	3.962017	89	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	53507.49	3.4614	54,277.00	3.4614	99	50 - 150	0.0000	+/-0.50	
M5PFPeA	226877.4	1.79965	238,015.00	1.79965	95	50 - 150	0.0000	+/-0.50	
M5PFHxA	328954.2	2.696967	338,364.00	2.696967	97	50 - 150	0.0000	+/-0.50	
M3PFHxS	53402.04	3.242583	55,970.00	3.242583	95	50 - 150	0.0000	+/-0.50	
M4PFHpA	351076.3	3.21145	370,206.00	3.21145	95	50 - 150	0.0000	+/-0.50	
M8PFOA	392436.2	3.469917	407,582.00	3.4779	96	50 - 150	-0.0080	+/-0.50	
M8PFOS	53649.57	3.65215	60,566.00	3.660133	89	50 - 150	-0.0080	+/-0.50	
M9PFNA	385261.3	3.653183	421,439.00	3.661183	91	50 - 150	-0.0080	+/-0.50	
MPFDoA	305829.6	4.096633	365,521.00	4.104633	84	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	108213.3	3.969483	119,169.00	3.969483	91	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	126645.9	3.889733	138,888.00	3.889733	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
LCS (B333470-BS1)		Lab File ID: B333470-BS1.d			Analyzed: 03/13/23 12:11				
M8FOSA	175314.3	3.996567	202,124.00	4.00455	87	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	64137.9	2.6118	70,921.00	2.6118	90	50 - 150	0.0000	+/-0.50	
M2PFTA	445898.1	4.3378	484,398.00	4.345917	92	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	63618.3	3.810767	58,951.00	3.818733	108	50 - 150	-0.0080	+/-0.50	
MPFBA	236064.3	1.0917	234,256.00	1.0834	101	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	54254.18	2.91295	71,810.00	2.91295	76	50 - 150	0.0000	+/-0.50	
M6PFDA	389509	3.811283	342,979.00	3.81925	114	50 - 150	-0.0080	+/-0.50	
M3PFBS	79430.81	1.986217	75,822.00	1.978033	105	50 - 150	0.0082	+/-0.50	
M7PFUnA	382523.3	3.962017	409,442.00	3.962017	93	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	56786.98	3.4614	54,277.00	3.4614	105	50 - 150	0.0000	+/-0.50	
M5PFPeA	250852.2	1.79965	238,015.00	1.79965	105	50 - 150	0.0000	+/-0.50	
M5PFHxA	365242.8	2.696967	338,364.00	2.696967	108	50 - 150	0.0000	+/-0.50	
M3PFHxS	56654.4	3.242583	55,970.00	3.242583	101	50 - 150	0.0000	+/-0.50	
M4PFHpA	394817.1	3.21145	370,206.00	3.21145	107	50 - 150	0.0000	+/-0.50	
M8PFOA	430782.1	3.469917	407,582.00	3.4779	106	50 - 150	-0.0080	+/-0.50	
M8PFOS	58083.58	3.65215	60,566.00	3.660133	96	50 - 150	-0.0080	+/-0.50	
M9PFNA	440133.2	3.653183	421,439.00	3.661183	104	50 - 150	-0.0080	+/-0.50	
MPFDoA	324711.9	4.104633	365,521.00	4.104633	89	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	108425.6	3.969483	119,169.00	3.969483	91	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	136417.3	3.889733	138,888.00	3.889733	98	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 (B333470-MS1)		Lab File ID: B333470-MS1.d				Analyzed: 03/13/23 12:25			
M8FOSA	182224.3	4.00455	202,124.00	4.00455	90	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	37733.47	2.603583	70,921.00	2.6118	53	50 - 150	-0.0082	+/-0.50	
M2PFTA	403251.9	4.3378	484,398.00	4.345917	83	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	42475.59	3.810767	58,951.00	3.818733	72	50 - 150	-0.0080	+/-0.50	
MPFBA	227573.3	1.0917	234,256.00	1.0834	97	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	59262.99	2.91295	71,810.00	2.91295	83	50 - 150	0.0000	+/-0.50	
M6PFDA	363550.4	3.811283	342,979.00	3.81925	106	50 - 150	-0.0080	+/-0.50	
M3PFBS	77704.2	1.978033	75,822.00	1.978033	102	50 - 150	0.0000	+/-0.50	
M7PFUnA	380885.2	3.962017	409,442.00	3.962017	93	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	39927.18	3.4614	54,277.00	3.4614	74	50 - 150	0.0000	+/-0.50	
M5PFPeA	246131.8	1.79965	238,015.00	1.79965	103	50 - 150	0.0000	+/-0.50	
M5PFHxA	355500.7	2.696967	338,364.00	2.696967	105	50 - 150	0.0000	+/-0.50	
M3PFHxS	55210.39	3.242583	55,970.00	3.242583	99	50 - 150	0.0000	+/-0.50	
M4PFHpA	370553.3	3.21145	370,206.00	3.21145	100	50 - 150	0.0000	+/-0.50	
M8PFOA	408619.9	3.469917	407,582.00	3.4779	100	50 - 150	-0.0080	+/-0.50	
M8PFOS	56917.61	3.65215	60,566.00	3.660133	94	50 - 150	-0.0080	+/-0.50	
M9PFNA	435149.4	3.653183	421,439.00	3.661183	103	50 - 150	-0.0080	+/-0.50	
MPFDoA	313973.4	4.104633	365,521.00	4.104633	86	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	106574.8	3.969483	119,169.00	3.969483	89	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	135885.7	3.889733	138,888.00	3.889733	98	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 (B333470-MSD1)			Lab File ID: B333470-MSD1.d			Analyzed: 03/13/23 12:40			
M8FOSA	173890.8	4.00455	202,124.00	4.00455	86	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	38114.93	2.603583	70,921.00	2.6118	54	50 - 150	-0.0082	+/-0.50	
M2PFTA	351627.7	4.3378	484,398.00	4.345917	73	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	40313.57	3.810767	58,951.00	3.818733	68	50 - 150	-0.0080	+/-0.50	
MPFBA	207709.5	1.0834	234,256.00	1.0834	89	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	54267.86	2.91295	71,810.00	2.91295	76	50 - 150	0.0000	+/-0.50	
M6PFDA	325914.6	3.811283	342,979.00	3.81925	95	50 - 150	-0.0080	+/-0.50	
M3PFBS	72632.79	1.978033	75,822.00	1.978033	96	50 - 150	0.0000	+/-0.50	
M7PFUnA	324314.3	3.962017	409,442.00	3.962017	79	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	36599.55	3.4614	54,277.00	3.4614	67	50 - 150	0.0000	+/-0.50	
M5PFPeA	226760.7	1.791367	238,015.00	1.79965	95	50 - 150	-0.0083	+/-0.50	
M5PFHxA	333159.6	2.68875	338,364.00	2.696967	98	50 - 150	-0.0082	+/-0.50	
M3PFHxS	53134.1	3.242583	55,970.00	3.242583	95	50 - 150	0.0000	+/-0.50	
M4PFHpA	356314.9	3.21145	370,206.00	3.21145	96	50 - 150	0.0000	+/-0.50	
M8PFOA	408289.2	3.469917	407,582.00	3.4779	100	50 - 150	-0.0080	+/-0.50	
M8PFOS	55750.04	3.65215	60,566.00	3.660133	92	50 - 150	-0.0080	+/-0.50	
M9PFNA	387679.8	3.653183	421,439.00	3.661183	92	50 - 150	-0.0080	+/-0.50	
MPFDoA	273611	4.096633	365,521.00	4.104633	75	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	87100.81	3.969483	119,169.00	3.969483	73	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	109025.3	3.889733	138,888.00	3.889733	78	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
Perfluorobutanesulfonic acid (PFBS)	NH-P
Perfluoropentanoic acid (PFPeA)	NH-P
Perfluorohexanoic acid (PFHxA)	NH-P
11Cl-PF3OUdS (F53B Major)	NH-P
9Cl-PF3ONS (F53B Minor)	NH-P
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P
Perfluorodecanoic acid (PFDA)	NH-P
Perfluorododecanoic acid (PFDoA)	NH-P
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P
Perfluoroheptanesulfonic acid (PFHpS)	NH-P
N-EtFOSAA (NEtFOSAA)	NH-P
N-MeFOSAA (NMeFOSAA)	NH-P
Perfluorotetradecanoic acid (PFTA)	NH-P
Perfluorotridecanoic acid (PFTrDA)	NH-P
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P
Perfluorodecanesulfonic acid (PFDS)	NH-P
Perfluorooctanesulfonamide (FOSA)	NH-P
Perfluorononanesulfonic acid (PFNS)	NH-P
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P
Perfluoro-1-butanedisulfonamide (FBSA)	NH-P
Perfluorohexanesulfonic acid (PFHxS)	NH-P
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P
Perfluoropentanesulfonic acid (PFPeS)	NH-P
Perfluoroundecanoic acid (PFUnA)	NH-P
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P
Perfluoroheptanoic acid (PFHpA)	NH-P
Perfluorooctanoic acid (PFOA)	NH-P
Perfluorooctanesulfonic acid (PFOS)	NH-P
Perfluorononanoic acid (PFNA)	NH-P

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

[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.

AN

59 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.pacelabs.com

ENV-FRM-ELON-0009V02__Sample Receiving Checklist 1-12-2023

Log In Back-Sheet

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



Client Barnstable County
Project BETA
MCP/RCP Required No
Deliverable Package Req. No
Location Barnstable, MA
PWSID# (When Applicable) NA
Arrival Method:
Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐
Received By / Date / Time AK 2/14/23 1550
Back-Sheet By / Date / Time AK 2/14/23 2149
Temperature Method gun # 5
Temp ☒ < 6° C Actual Temperature 4.8
Rush Samples: Yes / ☒ No Notify
Short Hold: Yes / ☒ No Notify

Notes regarding Samples/COC outside of SOP:

	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> ☐	☐

Container (Circle when applicable)	UnP	HCl	HNO3	H2SO4	NaOH	Trizma	Na2S2O3	Other Preservative
1L Amber Plastic								
500 mL Amber Plastic								
250 mL Amber <u>Plastic</u>	<u>12</u>							
Other Amber Clear Plastic								
16oz Amber Clear								
8oz Amber Clear								
4oz Amber Clear								
2oz Amber Clear								
Col/Bacteria								
Flashpoint								
Plastic Bag								
SOC Kit								
Perchlorate								
Encore								
Frozen								
Proper Headspace	UnP	HCl	MeOH	Bisulfate	DI	Thiosulfate	Sulfuric	Other
Vials								

March 28, 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: 23C1758

Enclosed are results of analyses for samples as received by the laboratory on March 16, 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: 3/28/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23C1758

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
Bldg 1- Kitchen Tap	23C1758-01	Drinking Water		SOP-454 PFAS	
GWTS#2- Mid Point	23C1758-02	Ground Water		SOP-454 PFAS	
GWTS#2- Effluent	23C1758-03	Ground Water		SOP-454 PFAS	
Influent	23C1758-04	Ground Water		SOP-454 PFAS	
Mid-Point	23C1758-05	Ground Water		SOP-454 PFAS	
Effluent	23C1758-06	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:****PF-19**

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

Analyte & Samples(s) Qualified:**Perfluorooctanesulfonic acid (PFOS)**

23C1758-04RE2[Influent]

PF-23

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

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

23C1758-04[Influent]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**D3-NMeFOSAA**

B334616-BS1

M2-4:2FTS

23C1758-03[GWTS#2- Effluent], B334616-MSD2

M2-6:2FTS

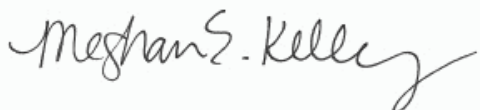
23C1758-04[Influent]

M2-8:2FTS

B334616-BS1

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23C1758

Date Received: 3/16/2023

Field Sample #: Bldg 1- Kitchen Tap

Sampled: 3/13/2023 14:45

Sample ID: 23C1758-01

Sample Matrix: Drinking Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	MCL/SMCL		Units	Dilution	Flag/Qual	Method	Date	Date/Time	Analyst
		RL	MA ORSG					Prepared	Analyzed	
Perfluorobutanoic acid (PFBA)	3.5	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluoropentanoic acid (PFPeA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorohexanoic acid (PFHxA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
11Cl-PF3OUdS (F53B Major)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
9Cl-PF3ONS (F53B Minor)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorodecanoic acid (PFDA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorododecanoic acid (PFDoA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
N-EtFOSAA (NEtFOSAA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
N-MeFOSAA (NMeFOSAA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorotetradecanoic acid (PFTA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorooctanesulfonamide (FOSA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorononanesulfonic acid (PFNS)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluoroundecanoic acid (PFUnA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluoroheptanoic acid (PFHpA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorooctanoic acid (PFOA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorooctanesulfonic acid (PFOS)	4.1	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB
Perfluorononanoic acid (PFNA)	ND	1.8		ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:39	RRB

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23C1758

Date Received: 3/16/2023

Field Sample #: GWTS#2- Mid Point

Sampled: 3/13/2023 15:35

Sample ID: 23C1758-02

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)	7.0	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorobutanesulfonic acid (PFBS)	2.1	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluoropentanoic acid (PFPeA)	23	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorohexanoic acid (PFHxA)	20	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
11Cl-PF3OUdS (F53B Major)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
9Cl-PF3ONS (F53B Minor)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorodecanoic acid (PFDA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorododecanoic acid (PFDoA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
N-EtFOSAA (NEtFOSAA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
N-MeFOSAA (NMeFOSAA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorotetradecanoic acid (PFTA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorotridecanoic acid (PFTTrDA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorooctanesulfonamide (FOSA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorononanesulfonic acid (PFNS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	12	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluoro-1-butanefulfonamide (FBFA)	3.4	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorohexanesulfonic acid (PFHxS)	32	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	29	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluoropentanesulfonic acid (PFPeS)	3.1	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluoroundecanoic acid (PFUnA)	8.1	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluoroheptanoic acid (PFHpA)	12	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorooctanoic acid (PFOA)	6.7	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorooctanesulfonic acid (PFOS)	110	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB
Perfluorononanoic acid (PFNA)	4.1	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:46	RRB

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23C1758

Date Received: 3/16/2023

Field Sample #: GWTS#2- Effluent

Sampled: 3/13/2023 15:30

Sample ID: 23C1758-03

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	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluoropentanoic acid (PFPeA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorohexanoic acid (PFHxA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
11Cl-PF3OUdS (F53B Major)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
9Cl-PF3ONS (F53B Minor)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorodecanoic acid (PFDA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorododecanoic acid (PFDoA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
N-EtFOSAA (NEtFOSAA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
N-MeFOSAA (NMeFOSAA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorotetradecanoic acid (PFTA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorotridecanoic acid (PFTTrDA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorooctanesulfonamide (FOSA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorononanesulfonic acid (PFNS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluoroundecanoic acid (PFUnA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluoroheptanoic acid (PFHpA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorooctanoic acid (PFOA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorooctanesulfonic acid (PFOS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB
Perfluorononanoic acid (PFNA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 14:54	RRB

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23C1758

Date Received: 3/16/2023

Sampled: 3/13/2023 15:05

Field Sample #: Influent

Sample ID: 23C1758-04

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)	29	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorobutanesulfonic acid (PFBS)	10	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluoropentanoic acid (PFPeA)	99	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorohexanoic acid (PFHxA)	94	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
11Cl-PF3OUdS (F53B Major)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
9Cl-PF3ONS (F53B Minor)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	49	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorodecanoic acid (PFDA)	3.7	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorododecanoic acid (PFDoA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluoroheptanesulfonic acid (PFHpS)	5.5	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
N-EtFOSAA (NEtFOSAA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
N-MeFOSAA (NMeFOSAA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorotetradecanoic acid (PFTA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorotridecanoic acid (PFTTrDA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorodecanesulfonic acid (PFDS)	3.1	2.2	ng/L	1	PF-23	SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorooctanesulfonamide (FOSA)	2.7	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorononanesulfonic acid (PFNS)	4.5	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	69	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluoro-1-butanefulfonamide (FBFA)	16	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorohexanesulfonic acid (PFHxS)	140	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	130	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluoropentanesulfonic acid (PFPeS)	15	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluoroundecanoic acid (PFUnA)	36	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluoroheptanoic acid (PFHpA)	52	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorooctanoic acid (PFOA)	30	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB
Perfluorooctanesulfonic acid (PFOS)	440	22	ng/L	10	PF-19	SOP-454 PFAS	3/20/23	3/24/23 17:57	DRL
Perfluorononanoic acid (PFNA)	18	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:01	RRB

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23C1758

Date Received: 3/16/2023

Sampled: 3/13/2023 15:00

Field Sample #: Mid-Point

Sample ID: 23C1758-05

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	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluoropentanoic acid (PFPeA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorohexanoic acid (PFHxA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
11Cl-PF3OUdS (F53B Major)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
9Cl-PF3ONS (F53B Minor)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorodecanoic acid (PFDA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorododecanoic acid (PFDoA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
N-EtFOSAA (NEtFOSAA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
N-MeFOSAA (NMeFOSAA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorotetradecanoic acid (PFTA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorotridecanoic acid (PFTTrDA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorooctanesulfonamide (FOSA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorononanesulfonic acid (PFNS)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluoroundecanoic acid (PFUnA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluoroheptanoic acid (PFHpA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorooctanoic acid (PFOA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorooctanesulfonic acid (PFOS)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB
Perfluorononanoic acid (PFNA)	ND	2.2	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:08	RRB

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23C1758

Date Received: 3/16/2023

Field Sample #: Effluent

Sampled: 3/13/2023 14:55

Sample ID: 23C1758-06

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	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorobutanesulfonic acid (PFBS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluoropentanoic acid (PFPeA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorohexanoic acid (PFHxA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
11Cl-PF3OUdS (F53B Major)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
9Cl-PF3ONS (F53B Minor)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorodecanoic acid (PFDA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorododecanoic acid (PFDoA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
N-EtFOSAA (NEtFOSAA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
N-MeFOSAA (NMeFOSAA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorotetradecanoic acid (PFTA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorotridecanoic acid (PFTTrDA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorodecanesulfonic acid (PFDS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorooctanesulfonamide (FOSA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorononanesulfonic acid (PFNS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluoro-1-butanefulfonamide (FBFA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorohexanesulfonic acid (PFHxS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluoropentanesulfonic acid (PFPeS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluoroundecanoic acid (PFUnA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluoroheptanoic acid (PFHpA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorooctanoic acid (PFOA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorooctanesulfonic acid (PFOS)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB
Perfluorononanoic acid (PFNA)	ND	2.1	ng/L	1		SOP-454 PFAS	3/20/23	3/21/23 15:15	RRB

Sample Extraction Data**Prep Method: SOP 454-PFAAS Analytical Method: SOP-454 PFAS**

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23C1758-01 [Bldg 1- Kitchen Tap]	B334616	273	1.00	03/20/23
23C1758-02 [GWTS#2- Mid Point]	B334616	242	1.00	03/20/23
23C1758-03 [GWTS#2- Effluent]	B334616	239	1.00	03/20/23
23C1758-04 [Influent]	B334616	228	1.00	03/20/23
23C1758-04RE2 [Influent]	B334616	228	1.00	03/20/23
23C1758-05 [Mid-Point]	B334616	230	1.00	03/20/23
23C1758-06 [Effluent]	B334616	242	1.00	03/20/23

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

Batch B334616 - SOP 454-PFAAS
Blank (B334616-BLK1)

Prepared: 03/20/23 Analyzed: 03/21/23

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 (B334616-BS1)

Prepared: 03/20/23 Analyzed: 03/21/23

Perfluorobutanoic acid (PFBA)	9.76	1.9	ng/L	9.43	104	73-129
Perfluorobutanesulfonic acid (PFBS)	8.26	1.9	ng/L	8.34	99.0	72-130
Perfluoropentanoic acid (PFPeA)	9.37	1.9	ng/L	9.43	99.5	72-129
Perfluorohexanoic acid (PFHxA)	9.35	1.9	ng/L	9.43	99.2	72-129
11Cl-PF3OUdS (F53B Major)	8.19	1.9	ng/L	8.88	92.2	55.1-141
9Cl-PF3ONS (F53B Minor)	9.12	1.9	ng/L	8.78	104	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.66	1.9	ng/L	8.88	97.5	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.25	1.9	ng/L	9.43	98.2	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.00	1.9	ng/L	9.05	99.4	67-138
Perfluorodecanoic acid (PFDA)	10.2	1.9	ng/L	9.43	108	71-129
Perfluorododecanoic acid (PFDoA)	9.23	1.9	ng/L	9.43	97.9	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	9.06	1.9	ng/L	8.39	108	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

Batch B334616 - SOP 454-PFAAS
LCS (B334616-BS1)

Prepared: 03/20/23 Analyzed: 03/21/23

Perfluoroheptanesulfonic acid (PFHpS)	10.4	1.9	ng/L	9.00		115	69-134			
N-EtFOSAA (NEtFOSAA)	10.9	1.9	ng/L	9.43		115	61-135			
N-MeFOSAA (NMeFOSAA)	11.1	1.9	ng/L	9.43		118	65-136			
Perfluorotetradecanoic acid (PFTA)	10.2	1.9	ng/L	9.43		109	71-132			
Perfluorotridecanoic acid (PFTTrDA)	8.97	1.9	ng/L	9.43		95.2	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.71	1.9	ng/L	8.81		98.8	63-143			
Perfluorodecanesulfonic acid (PFDS)	6.76	1.9	ng/L	9.10		74.4	53-142			
Perfluorooctanesulfonamide (FOSA)	9.29	1.9	ng/L	9.43		98.6	67-137			
Perfluorononanesulfonic acid (PFNS)	9.27	1.9	ng/L	9.05		102	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	8.92	1.9	ng/L	9.43		94.7	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	10.8	1.9	ng/L	9.43		115	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	8.94	1.9	ng/L	8.62		104	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	9.40	1.9	ng/L	9.43		99.7	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	9.39	1.9	ng/L	9.43		99.6	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	10.2	1.9	ng/L	8.95		114	64-140			
Perfluoropentanesulfonic acid (PFPeS)	9.01	1.9	ng/L	8.86		102	71-127			
Perfluoroundecanoic acid (PFUnA)	8.50	1.9	ng/L	9.43		90.1	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.64	1.9	ng/L	9.43		91.7	58.5-143			
Perfluoroheptanoic acid (PFHpA)	9.31	1.9	ng/L	9.43		98.8	72-130			
Perfluorooctanoic acid (PFOA)	9.04	1.9	ng/L	9.43		95.9	71-133			
Perfluorooctanesulfonic acid (PFOS)	8.26	1.9	ng/L	8.72		94.7	65-140			
Perfluorononanoic acid (PFNA)	9.64	1.9	ng/L	9.43		102	69-130			

Matrix Spike (B334616-MS2)
Source: 23C1758-05

Prepared: 03/20/23 Analyzed: 03/21/23

Perfluorobutanoic acid (PFBA)	11.9	2.1	ng/L	10.5	1.29	101	73-129			
Perfluorobutanesulfonic acid (PFBS)	8.97	2.1	ng/L	9.32	ND	96.3	72-130			
Perfluoropentanoic acid (PFPeA)	11.5	2.1	ng/L	10.5	ND	109	72-129			
Perfluorohexanoic acid (PFHxA)	13.6	2.1	ng/L	10.5	ND	129	72-129			
11Cl-PF3OUdS (F53B Major)	8.69	2.1	ng/L	9.92	ND	87.6	58.3-140			
9Cl-PF3ONS (F53B Minor)	10.1	2.1	ng/L	9.82	ND	102	61.4-144			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	10.0	2.1	ng/L	9.92	ND	101	62.4-128			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.06	2.1	ng/L	10.5	ND	86.0	36.7-171			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.2	2.1	ng/L	10.1	ND	100	67-138			
Perfluorodecanoic acid (PFDA)	10.2	2.1	ng/L	10.5	ND	96.8	71-129			
Perfluorododecanoic acid (PFDoA)	10.7	2.1	ng/L	10.5	ND	101	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	10.2	2.1	ng/L	9.37	ND	109	54.3-149			
Perfluoroheptanesulfonic acid (PFHpS)	10.2	2.1	ng/L	10.1	ND	101	69-134			
N-EtFOSAA (NEtFOSAA)	11.3	2.1	ng/L	10.5	ND	108	61-135			
N-MeFOSAA (NMeFOSAA)	11.1	2.1	ng/L	10.5	ND	105	65-136			
Perfluorotetradecanoic acid (PFTA)	11.0	2.1	ng/L	10.5	ND	105	71-132			
Perfluorotridecanoic acid (PFTTrDA)	10.3	2.1	ng/L	10.5	ND	97.5	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.92	2.1	ng/L	9.85	ND	101	63-143			
Perfluorodecanesulfonic acid (PFDS)	8.29	2.1	ng/L	10.2	ND	81.6	53-142			
Perfluorooctanesulfonamide (FOSA)	10.0	2.1	ng/L	10.5	ND	94.9	67-137			
Perfluorononanesulfonic acid (PFNS)	10.2	2.1	ng/L	10.1	ND	101	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	12.9	2.1	ng/L	10.5	ND	122	64.2-154			
Perfluoro-1-butanefulfonamide (FBSA)	11.7	2.1	ng/L	10.5	ND	111	65.9-140			
Perfluorohexanesulfonic acid (PFHxS)	9.75	2.1	ng/L	9.64	ND	101	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	9.84	2.1	ng/L	10.5	ND	93.4	61.9-143			
Perfluoro-5-oxahexanoic acid (PFMBA)	10.3	2.1	ng/L	10.5	ND	97.4	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

Batch B334616 - SOP 454-PFAAS

Matrix Spike (B334616-MS2)		Source: 23C1758-05			Prepared: 03/20/23 Analyzed: 03/21/23					
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12.1	2.1	ng/L	10.0	ND	121	64-140			
Perfluoropetanesulfonic acid (PFPeS)	9.88	2.1	ng/L	9.90	ND	99.8	71-127			
Perfluoroundecanoic acid (PFUnA)	9.15	2.1	ng/L	10.5	ND	86.9	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.5	2.1	ng/L	10.5	ND	99.3	62-138			
Perfluoroheptanoic acid (PFHpA)	10.4	2.1	ng/L	10.5	ND	99.0	72-130			
Perfluorooctanoic acid (PFOA)	10.3	2.1	ng/L	10.5	ND	97.4	71-133			
Perfluorooctanesulfonic acid (PFOS)	11.5	2.1	ng/L	9.74	ND	118	65-140			
Perfluorononanoic acid (PFNA)	10.4	2.1	ng/L	10.5	ND	99.1	69-130			

Matrix Spike Dup (B334616-MSD2)		Source: 23C1758-05			Prepared: 03/20/23 Analyzed: 03/21/23					
Perfluorobutanoic acid (PFBA)	12.6	2.2	ng/L	10.8	1.29	105	73-129	5.12	30	
Perfluorobutanesulfonic acid (PFBS)	9.58	2.2	ng/L	9.51	ND	101	72-130	6.54	30	
Perfluoropentanoic acid (PFPeA)	11.7	2.2	ng/L	10.8	ND	109	72-129	1.98	30	
Perfluorohexanoic acid (PFHxA)	11.4	2.2	ng/L	10.8	ND	106	72-129	17.6	30	
11Cl-PF3OUdS (F53B Major)	8.92	2.2	ng/L	10.1	ND	88.1	58.3-140	2.58	30	
9Cl-PF3ONS (F53B Minor)	10.8	2.2	ng/L	10.0	ND	107	61.4-144	6.87	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	10.8	2.2	ng/L	10.1	ND	107	62.4-128	7.81	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.37	2.2	ng/L	10.8	ND	87.1	36.7-171	3.34	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.5	2.2	ng/L	10.3	ND	101	67-138	2.91	30	
Perfluorodecanoic acid (PFDA)	10.2	2.2	ng/L	10.8	ND	95.0	71-129	0.129	30	
Perfluorododecanoic acid (PFDoA)	10.6	2.2	ng/L	10.8	ND	98.4	72-134	0.881	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	10.7	2.2	ng/L	9.57	ND	112	54.3-149	4.82	30	
Perfluoroheptanesulfonic acid (PFHpS)	11.8	2.2	ng/L	10.3	ND	115	69-134	15.0	30	
N-EtFOSAA (NEtFOSAA)	12.5	2.2	ng/L	10.8	ND	116	61-135	9.49	30	
N-MeFOSAA (NMeFOSAA)	12.3	2.2	ng/L	10.8	ND	114	65-136	10.1	30	
Perfluorotetradecanoic acid (PFTA)	11.8	2.2	ng/L	10.8	ND	110	71-132	6.57	30	
Perfluorotridecanoic acid (PFTrDA)	12.0	2.2	ng/L	10.8	ND	111	65-144	15.2	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.2	2.2	ng/L	10.1	ND	101	63-143	2.64	30	
Perfluorodecanesulfonic acid (PFDS)	8.75	2.2	ng/L	10.4	ND	84.3	53-142	5.38	30	
Perfluorooctanesulfonamide (FOSA)	10.7	2.2	ng/L	10.8	ND	99.4	67-137	6.65	30	
Perfluorononanesulfonic acid (PFNS)	11.4	2.2	ng/L	10.3	ND	110	69-127	11.1	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	12.4	2.2	ng/L	10.8	ND	115	64.2-154	3.96	30	
Perfluoro-1-butanedisulfonamide (FBSA)	12.0	2.2	ng/L	10.8	ND	111	65.9-140	2.35	30	
Perfluorohexanesulfonic acid (PFHxS)	10.1	2.2	ng/L	9.84	ND	102	68-131	3.25	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	10.3	2.2	ng/L	10.8	ND	96.2	61.9-143	5.05	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	10.7	2.2	ng/L	10.8	ND	100	61.4-142	4.61	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	11.4	2.2	ng/L	10.2	ND	112	64-140	5.88	30	
Perfluoropetanesulfonic acid (PFPeS)	10.1	2.2	ng/L	10.1	ND	99.8	71-127	2.08	30	
Perfluoroundecanoic acid (PFUnA)	10.0	2.2	ng/L	10.8	ND	93.1	69-133	8.92	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.9	2.2	ng/L	10.8	ND	101	62-138	3.93	30	
Perfluoroheptanoic acid (PFHpA)	10.9	2.2	ng/L	10.8	ND	102	72-130	4.70	30	
Perfluorooctanoic acid (PFOA)	10.7	2.2	ng/L	10.8	ND	99.6	71-133	4.35	30	
Perfluorooctanesulfonic acid (PFOS)	10.3	2.2	ng/L	9.94	ND	104	65-140	11.0	30	
Perfluorononanoic acid (PFNA)	11.1	2.2	ng/L	10.8	ND	103	69-130	5.98	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.
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
Bldg 1- Kitchen Tap (23C1758-01)			Lab File ID: 23C1758-01.d			Analyzed: 03/21/23 14:39			
M8FOSA	204287.1	4.00455	258,466.00	3.996567	79	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	55992.67	2.57895	80,267.00	2.57895	70	50 - 150	0.0000	+/-0.50	
M2PFTA	459460.3	4.329683	648,651.00	4.329683	71	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	64438.91	3.8028	71,947.00	3.8028	90	50 - 150	0.0000	+/-0.50	
MPFBA	237485.9	1.075083	300,906.00	1.075083	79	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	52097.23	2.896583	97,667.00	2.896583	53	50 - 150	0.0000	+/-0.50	
M6PFDA	393581.3	3.803317	465,766.00	3.803317	85	50 - 150	0.0000	+/-0.50	
M3PFBS	80591.82	1.96145	99,581.00	1.95315	81	50 - 150	0.0083	+/-0.50	
M7PFUnA	400364.3	3.946033	526,854.00	3.946033	76	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	48652.72	3.453267	65,093.00	3.445283	75	50 - 150	0.0080	+/-0.50	
M5PFPeA	241545	1.7743	301,402.00	1.7743	80	50 - 150	0.0000	+/-0.50	
M5PFHxA	358500.6	2.672333	432,769.00	2.663233	83	50 - 150	0.0091	+/-0.50	
M3PFHxS	61339.46	3.226417	73,496.00	3.226417	83	50 - 150	0.0000	+/-0.50	
M4PFHpA	390953.2	3.203083	465,920.00	3.195017	84	50 - 150	0.0081	+/-0.50	
M8PFOA	452645.8	3.461933	521,838.00	3.461933	87	50 - 150	0.0000	+/-0.50	
M8PFOS	61964.71	3.644167	75,326.00	3.644167	82	50 - 150	0.0000	+/-0.50	
M9PFNA	441363.9	3.6452	452,756.00	3.6452	97	50 - 150	0.0000	+/-0.50	
MPFDoA	352077.3	4.08865	484,379.00	4.08865	73	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	116626.5	3.9535	161,903.00	3.9535	72	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	138115.3	3.88175	175,786.00	3.88175	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
GWTS#2- Mid Point (23C1758-02)			Lab File ID: 23C1758-02.d			Analyzed: 03/21/23 14:46			
M8FOSA	203971.2	4.00455	258,466.00	3.996567	79	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	45141.95	2.57895	80,267.00	2.57895	56	50 - 150	0.0000	+/-0.50	
M2PFTA	452549.5	4.329683	648,651.00	4.329683	70	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	63980.23	3.8028	71,947.00	3.8028	89	50 - 150	0.0000	+/-0.50	
MPFBA	270569.2	1.0834	300,906.00	1.075083	90	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	82558.32	2.896583	97,667.00	2.896583	85	50 - 150	0.0000	+/-0.50	
M6PFDA	419645.9	3.803317	465,766.00	3.803317	90	50 - 150	0.0000	+/-0.50	
M3PFBS	95609.07	1.96145	99,581.00	1.95315	96	50 - 150	0.0083	+/-0.50	
M7PFUnA	435778	3.946033	526,854.00	3.946033	83	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	45295.98	3.453267	65,093.00	3.445283	70	50 - 150	0.0080	+/-0.50	
M5PFPeA	292651.4	1.7743	301,402.00	1.7743	97	50 - 150	0.0000	+/-0.50	
M5PFHxA	439034.4	2.672333	432,769.00	2.663233	101	50 - 150	0.0091	+/-0.50	
M3PFHxS	73661.83	3.226417	73,496.00	3.226417	100	50 - 150	0.0000	+/-0.50	
M4PFHpA	457422.3	3.203083	465,920.00	3.195017	98	50 - 150	0.0081	+/-0.50	
M8PFOA	520980	3.461933	521,838.00	3.461933	100	50 - 150	0.0000	+/-0.50	
M8PFOS	69065.86	3.644167	75,326.00	3.644167	92	50 - 150	0.0000	+/-0.50	
M9PFNA	486722.4	3.6452	452,756.00	3.6452	108	50 - 150	0.0000	+/-0.50	
MPFDoA	368743.9	4.08865	484,379.00	4.08865	76	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	111946.6	3.9535	161,903.00	3.9535	69	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	144556.5	3.88175	175,786.00	3.88175	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
GWTS#2- Effluent (23C1758-03)			Lab File ID: 23C1758-03.d			Analyzed: 03/21/23 14:54			
M8FOSA	179248.4	4.00455	258,466.00	3.996567	69	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	35732.13	2.57895	80,267.00	2.57895	45	50 - 150	0.0000	+/-0.50	*
M2PFTA	398342	4.329683	648,651.00	4.329683	61	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	47568.18	3.8028	71,947.00	3.8028	66	50 - 150	0.0000	+/-0.50	
MPFBA	224754.8	1.0834	300,906.00	1.075083	75	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	73245	2.896583	97,667.00	2.896583	75	50 - 150	0.0000	+/-0.50	
M6PFDA	340317.1	3.803317	465,766.00	3.803317	73	50 - 150	0.0000	+/-0.50	
M3PFBS	72351.87	1.96145	99,581.00	1.95315	73	50 - 150	0.0083	+/-0.50	
M7PFUnA	357575.8	3.954033	526,854.00	3.946033	68	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	38691.23	3.453267	65,093.00	3.445283	59	50 - 150	0.0080	+/-0.50	
M5PFPeA	223870.9	1.7743	301,402.00	1.7743	74	50 - 150	0.0000	+/-0.50	
M5PFHxA	331766.2	2.672333	432,769.00	2.663233	77	50 - 150	0.0091	+/-0.50	
M3PFHxS	56326.38	3.226417	73,496.00	3.226417	77	50 - 150	0.0000	+/-0.50	
M4PFHpA	370313.8	3.203083	465,920.00	3.195017	79	50 - 150	0.0081	+/-0.50	
M8PFOA	402669.2	3.461933	521,838.00	3.461933	77	50 - 150	0.0000	+/-0.50	
M8PFOS	57977.41	3.644167	75,326.00	3.644167	77	50 - 150	0.0000	+/-0.50	
M9PFNA	398133.7	3.6452	452,756.00	3.6452	88	50 - 150	0.0000	+/-0.50	
MPFDoA	307527.1	4.08865	484,379.00	4.08865	63	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	101107.9	3.9535	161,903.00	3.9535	62	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	118633.1	3.88175	175,786.00	3.88175	67	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
Influent (23C1758-04) Lab File ID: 23C1758-04.d Analyzed: 03/21/23 15:01									
M8FOSA	201109.1	4.00455	258,466.00	3.996567	78	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	53211.7	2.57895	80,267.00	2.57895	66	50 - 150	0.0000	+/-0.50	
M2PFTA	478227.1	4.329683	648,651.00	4.329683	74	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	65540.22	3.8028	71,947.00	3.8028	91	50 - 150	0.0000	+/-0.50	
MPFBA	219529.7	1.075083	300,906.00	1.075083	73	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	69350.23	2.896583	97,667.00	2.896583	71	50 - 150	0.0000	+/-0.50	
M6PFDA	425276.5	3.803317	465,766.00	3.803317	91	50 - 150	0.0000	+/-0.50	
M3PFBS	93543.53	1.96145	99,581.00	1.95315	94	50 - 150	0.0083	+/-0.50	
M7PFUnA	441118.3	3.946033	526,854.00	3.946033	84	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	112969.6	3.453267	65,093.00	3.445283	174	50 - 150	0.0080	+/-0.50	*
M5PFPeA	274908.7	1.7743	301,402.00	1.7743	91	50 - 150	0.0000	+/-0.50	
M5PFHxA	402931.3	2.672333	432,769.00	2.663233	93	50 - 150	0.0091	+/-0.50	
M3PFHxS	69705.3	3.226417	73,496.00	3.226417	95	50 - 150	0.0000	+/-0.50	
M4PFHpA	443207.3	3.203083	465,920.00	3.195017	95	50 - 150	0.0081	+/-0.50	
M8PFOA	511415.1	3.461933	521,838.00	3.461933	98	50 - 150	0.0000	+/-0.50	
M8PFOS	62068.07	3.644167	75,326.00	3.644167	82	50 - 150	0.0000	+/-0.50	
M9PFNA	434311.3	3.6452	452,756.00	3.6452	96	50 - 150	0.0000	+/-0.50	
MPFDoA	383706.3	4.08865	484,379.00	4.08865	79	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	120189.2	3.9615	161,903.00	3.9535	74	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	142195.6	3.88175	175,786.00	3.88175	81	50 - 150	0.0000	+/-0.50	
Influent (23C1758-04RE2) Lab File ID: 23C1758-04RE1.d Analyzed: 03/24/23 17:57									
M8PFOS	75594.41	3.6362	86,626.00	3.636183	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
Mid-Point (23C1758-05)		Lab File ID: 23C1758-05.d				Analyzed: 03/21/23 15:08			
M8FOSA	228221.8	4.00455	258,466.00	3.996567	88	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	48544.61	2.57895	80,267.00	2.57895	60	50 - 150	0.0000	+/-0.50	
M2PFTA	523632.1	4.329683	648,651.00	4.329683	81	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	60898.02	3.8028	71,947.00	3.8028	85	50 - 150	0.0000	+/-0.50	
MPFBA	285381.1	1.0834	300,906.00	1.075083	95	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	75297.21	2.896583	97,667.00	2.896583	77	50 - 150	0.0000	+/-0.50	
M6PFDA	464107.7	3.803317	465,766.00	3.803317	100	50 - 150	0.0000	+/-0.50	
M3PFBS	95543.98	1.96145	99,581.00	1.95315	96	50 - 150	0.0083	+/-0.50	
M7PFUnA	476105.1	3.954033	526,854.00	3.946033	90	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	46872	3.453267	65,093.00	3.445283	72	50 - 150	0.0080	+/-0.50	
M5PFPeA	289434.4	1.7743	301,402.00	1.7743	96	50 - 150	0.0000	+/-0.50	
M5PFHxA	437403	2.672333	432,769.00	2.663233	101	50 - 150	0.0091	+/-0.50	
M3PFHxS	71809.26	3.226417	73,496.00	3.226417	98	50 - 150	0.0000	+/-0.50	
M4PFHpA	475470.7	3.203083	465,920.00	3.195017	102	50 - 150	0.0081	+/-0.50	
M8PFOA	525008.8	3.461933	521,838.00	3.461933	101	50 - 150	0.0000	+/-0.50	
M8PFOS	77604.29	3.644167	75,326.00	3.644167	103	50 - 150	0.0000	+/-0.50	
M9PFNA	547650.1	3.6452	452,756.00	3.6452	121	50 - 150	0.0000	+/-0.50	
MPFDoA	424718.3	4.08865	484,379.00	4.08865	88	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	123382.4	3.9535	161,903.00	3.9535	76	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	148395.4	3.88175	175,786.00	3.88175	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
Effluent (23C1758-06) Lab File ID: 23C1758-06.d Analyzed: 03/21/23 15:15									
M8FOSA	220674.9	4.00455	258,466.00	3.996567	85	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	44733.53	2.57895	80,267.00	2.57895	56	50 - 150	0.0000	+/-0.50	
M2PFTA	544770.6	4.329683	648,651.00	4.329683	84	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	56309.48	3.8028	71,947.00	3.8028	78	50 - 150	0.0000	+/-0.50	
MPFBA	274370.4	1.075083	300,906.00	1.075083	91	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	91267.16	2.896583	97,667.00	2.896583	93	50 - 150	0.0000	+/-0.50	
M6PFDA	444735.1	3.803317	465,766.00	3.803317	95	50 - 150	0.0000	+/-0.50	
M3PFBS	94155.97	1.96145	99,581.00	1.95315	95	50 - 150	0.0083	+/-0.50	
M7PFUnA	441773	3.954033	526,854.00	3.946033	84	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	44194.17	3.453267	65,093.00	3.445283	68	50 - 150	0.0080	+/-0.50	
M5PFPeA	284505.4	1.7743	301,402.00	1.7743	94	50 - 150	0.0000	+/-0.50	
M5PFHxA	418919.3	2.672333	432,769.00	2.663233	97	50 - 150	0.0091	+/-0.50	
M3PFHxS	72428.41	3.226417	73,496.00	3.226417	99	50 - 150	0.0000	+/-0.50	
M4PFHpA	467316.6	3.203083	465,920.00	3.195017	100	50 - 150	0.0081	+/-0.50	
M8PFOA	506605.3	3.461933	521,838.00	3.461933	97	50 - 150	0.0000	+/-0.50	
M8PFOS	71550.03	3.644167	75,326.00	3.644167	95	50 - 150	0.0000	+/-0.50	
M9PFNA	502460.3	3.6452	452,756.00	3.6452	111	50 - 150	0.0000	+/-0.50	
MPFDaA	400139.8	4.08865	484,379.00	4.08865	83	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	130804.6	3.9615	161,903.00	3.9535	81	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	144644.3	3.88175	175,786.00	3.88175	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
Blank (B334616-BLK1)			Lab File ID: B334616-BLK1.d			Analyzed: 03/21/23 13:34			
M8FOSA	185673	3.996567	258,466.00	3.996567	72	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	54812.14	2.57895	80,267.00	2.57895	68	50 - 150	0.0000	+/-0.50	
M2PFTA	479712.9	4.329683	648,651.00	4.329683	74	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	60680.73	3.8028	71,947.00	3.8028	84	50 - 150	0.0000	+/-0.50	
MPFBA	244879.2	1.0834	300,906.00	1.075083	81	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	79217.78	2.896583	97,667.00	2.896583	81	50 - 150	0.0000	+/-0.50	
M6PFDA	372044.8	3.803317	465,766.00	3.803317	80	50 - 150	0.0000	+/-0.50	
M3PFBS	80488.86	1.96145	99,581.00	1.95315	81	50 - 150	0.0083	+/-0.50	
M7PFUnA	389548.3	3.946033	526,854.00	3.946033	74	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	53469.4	3.453267	65,093.00	3.445283	82	50 - 150	0.0080	+/-0.50	
M5PFPeA	252109.7	1.7826	301,402.00	1.7743	84	50 - 150	0.0083	+/-0.50	
M5PFHxA	375446	2.672333	432,769.00	2.663233	87	50 - 150	0.0091	+/-0.50	
M3PFHxS	62939.68	3.226417	73,496.00	3.226417	86	50 - 150	0.0000	+/-0.50	
M4PFHpA	413929.4	3.203083	465,920.00	3.195017	89	50 - 150	0.0081	+/-0.50	
M8PFOA	436904.4	3.461933	521,838.00	3.461933	84	50 - 150	0.0000	+/-0.50	
M8PFOS	64392.11	3.644167	75,326.00	3.644167	85	50 - 150	0.0000	+/-0.50	
M9PFNA	418342.7	3.6452	452,756.00	3.6452	92	50 - 150	0.0000	+/-0.50	
MPFDoA	370029	4.08865	484,379.00	4.08865	76	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	111050.9	3.9535	161,903.00	3.9535	69	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	129983.8	3.88175	175,786.00	3.88175	74	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 (B334616-BS1)			Lab File ID: B334616-BS1.d			Analyzed: 03/21/23 13:27			
M8FOSA	157807.8	4.00455	258,466.00	3.996567	61	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	57746.89	2.57895	80,267.00	2.57895	72	50 - 150	0.0000	+/-0.50	
M2PFTA	424286.1	4.329683	648,651.00	4.329683	65	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	112941.2	3.8028	71,947.00	3.8028	157	50 - 150	0.0000	+/-0.50	*
MPFBA	232813.4	1.0834	300,906.00	1.075083	77	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	50346.3	2.896583	97,667.00	2.896583	52	50 - 150	0.0000	+/-0.50	
M6PFDA	353267.1	3.803317	465,766.00	3.803317	76	50 - 150	0.0000	+/-0.50	
M3PFBS	78805.8	1.96145	99,581.00	1.95315	79	50 - 150	0.0083	+/-0.50	
M7PFUnA	350992.3	3.954033	526,854.00	3.946033	67	50 - 150	0.0080	+/-0.50	
M2-6:2FTS	63715.1	3.453267	65,093.00	3.445283	98	50 - 150	0.0080	+/-0.50	
M5PFPeA	249285.1	1.7826	301,402.00	1.7743	83	50 - 150	0.0083	+/-0.50	
M5PFHxA	369665.6	2.672333	432,769.00	2.663233	85	50 - 150	0.0091	+/-0.50	
M3PFHxS	56162.74	3.226417	73,496.00	3.226417	76	50 - 150	0.0000	+/-0.50	
M4PFHpA	397954.7	3.203083	465,920.00	3.195017	85	50 - 150	0.0081	+/-0.50	
M8PFOA	416641.2	3.461933	521,838.00	3.461933	80	50 - 150	0.0000	+/-0.50	
M8PFOS	54716.64	3.644167	75,326.00	3.644167	73	50 - 150	0.0000	+/-0.50	
M9PFNA	405051.7	3.653183	452,756.00	3.6452	89	50 - 150	0.0080	+/-0.50	
MPFDoA	291962.1	4.096633	484,379.00	4.08865	60	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	97800.51	3.9615	161,903.00	3.9535	60	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	74401.21	3.88175	175,786.00	3.88175	42	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 (B334616-MS2)		Lab File ID: B334616-MS2.d				Analyzed: 03/21/23 13:49			
M8FOSA	202556.8	3.996567	258,466.00	3.996567	78	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	43565.08	2.57895	80,267.00	2.57895	54	50 - 150	0.0000	+/-0.50	
M2PFTA	481358.2	4.329683	648,651.00	4.329683	74	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	55624.42	3.8028	71,947.00	3.8028	77	50 - 150	0.0000	+/-0.50	
MPFBA	259586.8	1.0834	300,906.00	1.075083	86	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	95221.56	2.896583	97,667.00	2.896583	97	50 - 150	0.0000	+/-0.50	
M6PFDA	397174.1	3.803317	465,766.00	3.803317	85	50 - 150	0.0000	+/-0.50	
M3PFBS	85477.78	1.96145	99,581.00	1.95315	86	50 - 150	0.0083	+/-0.50	
M7PFUnA	405642.4	3.946033	526,854.00	3.946033	77	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	44377.22	3.453267	65,093.00	3.445283	68	50 - 150	0.0080	+/-0.50	
M5PFPeA	266703.5	1.7743	301,402.00	1.7743	88	50 - 150	0.0000	+/-0.50	
M5PFHxA	391422.3	2.672333	432,769.00	2.663233	90	50 - 150	0.0091	+/-0.50	
M3PFHxS	63543.17	3.226417	73,496.00	3.226417	86	50 - 150	0.0000	+/-0.50	
M4PFHpA	421738.9	3.195017	465,920.00	3.195017	91	50 - 150	0.0000	+/-0.50	
M8PFOA	467072.9	3.461933	521,838.00	3.461933	90	50 - 150	0.0000	+/-0.50	
M8PFOS	65054.84	3.644167	75,326.00	3.644167	86	50 - 150	0.0000	+/-0.50	
M9PFNA	427464.2	3.6452	452,756.00	3.6452	94	50 - 150	0.0000	+/-0.50	
MPFDoA	351699.2	4.08865	484,379.00	4.08865	73	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	108548.1	3.9535	161,903.00	3.9535	67	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	135751	3.88175	175,786.00	3.88175	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
Matrix Spike Dup (B334616-MSD2)			Lab File ID: B334616-MSD2.d			Analyzed: 03/21/23 14:03			
M8FOSA	175643.2	3.996567	258,466.00	3.996567	68	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	39508.69	2.57895	80,267.00	2.57895	49	50 - 150	0.0000	+/-0.50	*
M2PFTA	374776.4	4.329683	648,651.00	4.329683	58	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	45274.25	3.8028	71,947.00	3.8028	63	50 - 150	0.0000	+/-0.50	
MPFBA	235292	1.0834	300,906.00	1.075083	78	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	84868.1	2.896583	97,667.00	2.896583	87	50 - 150	0.0000	+/-0.50	
M6PFDA	357489.3	3.803317	465,766.00	3.803317	77	50 - 150	0.0000	+/-0.50	
M3PFBS	76750.58	1.96145	99,581.00	1.95315	77	50 - 150	0.0083	+/-0.50	
M7PFUnA	339445.4	3.946033	526,854.00	3.946033	64	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	34765.57	3.445283	65,093.00	3.445283	53	50 - 150	0.0000	+/-0.50	
M5PFPeA	244702.8	1.7743	301,402.00	1.7743	81	50 - 150	0.0000	+/-0.50	
M5PFHxA	356005.3	2.672333	432,769.00	2.663233	82	50 - 150	0.0091	+/-0.50	
M3PFHxS	58492.52	3.226417	73,496.00	3.226417	80	50 - 150	0.0000	+/-0.50	
M4PFHpA	385917.3	3.195017	465,920.00	3.195017	83	50 - 150	0.0000	+/-0.50	
M8PFOA	422153.6	3.461933	521,838.00	3.461933	81	50 - 150	0.0000	+/-0.50	
M8PFOS	57370.77	3.644167	75,326.00	3.644167	76	50 - 150	0.0000	+/-0.50	
M9PFNA	409621.5	3.6452	452,756.00	3.6452	90	50 - 150	0.0000	+/-0.50	
MPFDoA	294411.6	4.08865	484,379.00	4.08865	61	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	98744.1	3.9535	161,903.00	3.9535	61	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	117198.1	3.873767	175,786.00	3.88175	67	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
Perfluorobutanesulfonic acid (PFBS)	NH-P
Perfluoropentanoic acid (PFPeA)	NH-P
Perfluorohexanoic acid (PFHxA)	NH-P
11Cl-PF3OUdS (F53B Major)	NH-P
9Cl-PF3ONS (F53B Minor)	NH-P
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P
Perfluorodecanoic acid (PFDA)	NH-P
Perfluorododecanoic acid (PFDoA)	NH-P
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P
Perfluoroheptanesulfonic acid (PFHpS)	NH-P
N-EtFOSAA (NEtFOSAA)	NH-P
N-MeFOSAA (NMeFOSAA)	NH-P
Perfluorotetradecanoic acid (PFTA)	NH-P
Perfluorotridecanoic acid (PFTrDA)	NH-P
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P
Perfluorodecanesulfonic acid (PFDS)	NH-P
Perfluorooctanesulfonamide (FOSA)	NH-P
Perfluorononanesulfonic acid (PFNS)	NH-P
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P
Perfluoro-1-butanedisulfonamide (FBSA)	NH-P
Perfluorohexanesulfonic acid (PFHxS)	NH-P
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P
Perfluoropentanesulfonic acid (PFPeS)	NH-P
Perfluoroundecanoic acid (PFUnA)	NH-P
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P
Perfluoroheptanoic acid (PFHpA)	NH-P
Perfluorooctanoic acid (PFOA)	NH-P
Perfluorooctanesulfonic acid (PFOS)	NH-P
Perfluorononanoic acid (PFNA)	NH-P

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

23C1758



Phone: 413-525-2332
Fax: 413-525-6405
Email: info@conestlabs.com

Barnstable County
3195 Main St. PO Box 427

Phone:

BFTA

Barnstable, MA

6206

Project Location:

Project Number:

Project Manager:

Con-Test Quote Name/Number:

Invoice Recipient:

Sampled By:

Pricilla Ellis - pellis@barnstablecounty.org

Laura Bouley

Client Sample ID / Description

Bldg 1 - Kitchen Tap

GWTS#2 - Mid Point

GWTS#2 - Effluent

Influent

Mid-Point

Mid-point MS/MSD

Beginning Date/Time

3.13.23 @ 14:45

3.13.23 @ 15:35

3.13.23 @ 15:30

3.13.23 @ 15:05

3.13.23 @ 15:00

3.13.23 @ 15:00

Ending Date/Time

3.14.23 8:00

3.15.23 12:57

3.15.23 13

3.15.23 15:15

3.15.23 17:00

3.15.23 17:05

Date/Time:

Date/Time:

Date/Time:

Date/Time:

Date/Time:

Date/Time:

Date/Time:

http://www.conestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
East Longmeadow, MA 01028

Requested Turnaround Time

7-Day ☐ 10-Day ☐

Due Date:

PFAS 15-Day (std) ☒

Orthophosphate Samples

1-Day ☐ 3-Day ☐

2-Day ☐ 4-Day ☐

Field Filtered

Lab to Filter

Field Filtered

Lab to Filter

PCB ONLY

SOXHLET

NON SOXHLET

Format: PDF ☒ EXCEL ☒

Other: ☐

CLP Like Data Pkg Required: ☐

Email To: info@conestlabs.com

Fax To #:

Matrix Code

DW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

GW

ANALYSIS REQUESTED

Preservation Code

Courier Use Only

Total Number Of:

VIALS

GLASS

PLASTIC

BACTERIA

ENCORE

Glassware in the fridge?

Glassware in freezer? Y / N

Prepackaged Cooler? Y / N

*Contest is not responsible for missing samples from prepacked coolers

Matrix Codes:

GW = Ground Water

WW = Waste Water

DW = Drinking Water

A = Air

S = Soil

SL = Sludge

SOL = Solid

O = Other (please define)

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

MCP Certification Form Required

CT RCP Required

RCP Certification Form Required

MA State DW Required

Other

Chromatogram

AIHA-LAP, LLC

WRTA

NWRA

School

Client Comments: *Lab requested MS/MSD. Sample confirmation and report to Rthibault@BETA-Inc.com & Lbouley@BETA-Inc.com

Detection Limit Requirements

MA

GW-1

CT

Other

Project Entity

Government

Federal

City

Municipality

21 J

Brownfield

MBTA

Project Entity

Government

Federal

City

Municipality

21 J

Brownfield

MBTA

Project Entity

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39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.pacelabs.com

ENV-FRM-ELON-0009V02__ Sample Receiving Checklist 1-12-2023

Log In Back-Sheet

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



Client Burnstable County
Project BETA
MCP/RCP Required MA MCP
Deliverable Package Req. N/A
Location Burnstable, MA
PWSID# (When Applicable) NA
Arrival Method:

Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐

Received By / Date / Time MEM 3/15/23 1705

Back-Sheet By / Date / Time LA 3/16/23 757

Temperature Method gln # 5

Temp ☒ < 6° C Actual Temperature 5.7

Rush Samples: Yes / No Notify

Short Hold: Yes / No Notify

Notes regarding Samples/COC outside of SOP:

ONN Received Double Volume
for MS/MSD and got
a Effluent Sample but not
on COC.

	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

Container (Circle when applicable)	UnP	HCl	HNO3	H2SO4	NaOH	Trizma	Na2S2O3	Other Preservative
1L Amber Plastic								
500 mL Amber Plastic								
250 mL Amber Plastic	14							
Other Amber Clear Plastic								
16oz Amber Clear								
8oz Amber Clear								
4oz Amber Clear								
2oz Amber Clear								
Col/Bacteria								
Flashpoint								
Plastic Bag								
SOC Kit								
Perchlorate								
Encore								
Frozen								
Proper Headspace	UnP	HCl	MeOH	Bisulfate	DI	Thiosulfate	Sulfuric	Other
Vials								

May 8, 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: 23D2524

Enclosed are results of analyses for samples as received by the laboratory on April 21, 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: 5/8/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23D2524

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)	23D2524-01	Ground Water		SOP-454 PFAS	
System #1 Mid	23D2524-02	Ground Water		SOP-454 PFAS	
System #1 Eff	23D2524-03	Ground Water		SOP-454 PFAS	
System #2 Mid	23D2524-04	Ground Water		SOP-454 PFAS	
System #2 Eff	23D2524-05	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.

SOP-454 PFAS**Qualifications:**

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:**M2-8:2FTS**

23D2524-02[System #1 Mid], 23D2524-03[System #1 Eff], 23D2524-04[System #2 Mid], 23D2524-05[System #2 Eff], B338155-BLK1

PF-18

Duplicate analysis confirmed Extracted Internal Standard failure due to matrix effects.

Analyte & Samples(s) Qualified:**M2-8:2FTS**

B338155-MS1, B338155-MSD1

PF-19

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

Analyte & Samples(s) Qualified:**Perfluorooctanesulfonic acid (PFOS)**

23D2524-01RE1[INF (PRW-4)]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**D3-NMeFOSAA**

S086959-CCV3

M2-4:2FTS

23D2524-05[System #2 Eff]

M2-8:2FTS

23D2524-01[INF (PRW-4)], B338155-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:**9CI-PF3ONS (F53B Minor)**

S086959-CCV3, S086959-CCV4

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: 23D2524

Date Received: 4/21/2023

Field Sample #: INF (PRW-4)

Sampled: 4/18/2023 07:00

Sample ID: 23D2524-01

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)	27	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorobutanesulfonic acid (PFBS)	9.4	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluoropentanoic acid (PFPeA)	97	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorohexanoic acid (PFHxA)	90	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
8:2 Fluorotelomersulfonic acid (8:2FTS A)	39	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorodecanoic acid (PFDA)	3.4	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluoroheptanesulfonic acid (PFHpS)	4.4	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorodecanesulfonic acid (PFDS)	2.9	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorooctanesulfonamide (FOSA)	3.7	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorononanesulfonic acid (PFNS)	3.7	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluoro-1-hexanesulfonamide (FHxSA)	44	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluoro-1-butanefulfonamide (FBFA)	14	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorohexanesulfonic acid (PFHxS)	150	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
6:2 Fluorotelomersulfonic acid (6:2FTS A)	120	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluoropentanesulfonic acid (PFPeS)	15	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluoroundecanoic acid (PFUnA)	40	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluoroheptanoic acid (PFHpA)	48	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorooctanoic acid (PFOA)	32	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2
Perfluorooctanesulfonic acid (PFOS)	300	18	ng/L	10	PF-19	SOP-454 PFAS	4/26/23	5/2/23 10:43	QNW
Perfluorononanoic acid (PFNA)	19	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:38	JR2

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D2524

Date Received: 4/21/2023

Field Sample #: System #1 Mid

Sampled: 4/18/2023 07:10

Sample ID: 23D2524-02

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)	4.5	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorobutanesulfonic acid (PFBS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluoropentanoic acid (PFPeA)	2.6	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorohexanoic acid (PFHxA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
11Cl-PF3OUdS (F53B Major)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
9Cl-PF3ONS (F53B Minor)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorodecanoic acid (PFDA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorododecanoic acid (PFDoA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
N-EtFOSAA (NEtFOSAA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
N-MeFOSAA (NMeFOSAA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorotetradecanoic acid (PFTA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorotridecanoic acid (PFTrDA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorodecanesulfonic acid (PFDS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorooctanesulfonamide (FOSA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorononanesulfonic acid (PFNS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorohexanesulfonic acid (PFHxS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluoropentanesulfonic acid (PFPeS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluoroundecanoic acid (PFUnA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluoroheptanoic acid (PFHpA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorooctanoic acid (PFOA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorooctanesulfonic acid (PFOS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2
Perfluorononanoic acid (PFNA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:46	JR2

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D2524

Date Received: 4/21/2023

Field Sample #: System #1 Eff

Sampled: 4/18/2023 07:20

Sample ID: 23D2524-03

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	4/26/23	4/28/23 7:53	JR2
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 7:53	JR2

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D2524

Date Received: 4/21/2023

Field Sample #: System #2 Mid

Sampled: 4/18/2023 07:45

Sample ID: 23D2524-04

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	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:00	JR2

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D2524

Date Received: 4/21/2023

Field Sample #: System #2 Eff

Sampled: 4/18/2023 07:30

Sample ID: 23D2524-05

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	4/26/23	4/28/23 8:07	JR2
Perfluorobutanesulfonic acid (PFBS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluoropentanoic acid (PFPeA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorohexanoic acid (PFHxA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
11Cl-PF3OUdS (F53B Major)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
9Cl-PF3ONS (F53B Minor)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorodecanoic acid (PFDA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorododecanoic acid (PFDoA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
N-EtFOSAA (NEtFOSAA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
N-MeFOSAA (NMeFOSAA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorotetradecanoic acid (PFTA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorotridecanoic acid (PFTrDA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorodecanesulfonic acid (PFDS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorooctanesulfonamide (FOSA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorononanesulfonic acid (PFNS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorohexanesulfonic acid (PFHxS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluoropentanesulfonic acid (PFPeS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluoroundecanoic acid (PFUnA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluoroheptanoic acid (PFHpA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorooctanoic acid (PFOA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorooctanesulfonic acid (PFOS)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2
Perfluorononanoic acid (PFNA)	ND	1.7	ng/L	1		SOP-454 PFAS	4/26/23	4/28/23 8:07	JR2

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
23D2524-01 [INF (PRW-4)]	B338155	278	1.00	04/26/23
23D2524-01RE1 [INF (PRW-4)]	B338155	278	1.00	04/26/23
23D2524-02 [System #1 Mid]	B338155	290	1.00	04/26/23
23D2524-03 [System #1 Eff]	B338155	284	1.00	04/26/23
23D2524-04 [System #2 Mid]	B338155	273	1.00	04/26/23
23D2524-05 [System #2 Eff]	B338155	286	1.00	04/26/23

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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

Batch B338155 - SOP 454-PFAAS

Blank (B338155-BLK1)

Prepared: 04/26/23 Analyzed: 04/28/23

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-butanefulfonamide (FBFA)	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 (B338155-BS1)

Prepared: 04/26/23 Analyzed: 04/28/23

Perfluorobutanoic acid (PFBA)	10.1	2.0	ng/L	9.86	103	73-129
Perfluorobutanesulfonic acid (PFBS)	8.53	2.0	ng/L	8.73	97.8	72-130
Perfluoropentanoic acid (PFPeA)	9.69	2.0	ng/L	9.86	98.3	72-129
Perfluorohexanoic acid (PFHxA)	9.81	2.0	ng/L	9.86	99.5	72-129
11Cl-PF3OUdS (F53B Major)	7.74	2.0	ng/L	9.29	83.3	55.1-141
9Cl-PF3ONS (F53B Minor)	8.50	2.0	ng/L	9.19	92.5	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.11	2.0	ng/L	9.29	98.1	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	10.0	2.0	ng/L	9.86	102	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.30	2.0	ng/L	9.47	98.2	67-138
Perfluorodecanoic acid (PFDA)	9.60	2.0	ng/L	9.86	97.3	71-129
Perfluorododecanoic acid (PFDoA)	9.53	2.0	ng/L	9.86	96.6	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	8.09	2.0	ng/L	8.78	92.1	49.4-154

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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 B338155 - SOP 454-PFAAS

LCS (B338155-BS1)

Prepared: 04/26/23 Analyzed: 04/28/23

Perfluoroheptanesulfonic acid (PFHpS)	9.53	2.0	ng/L	9.42		101	69-134			
N-EtFOSAA (NEtFOSAA)	10.5	2.0	ng/L	9.86		106	61-135			
N-MeFOSAA (NMeFOSAA)	10.4	2.0	ng/L	9.86		105	65-136			
Perfluorotetradecanoic acid (PFTA)	9.57	2.0	ng/L	9.86		97.0	71-132			
Perfluorotridecanoic acid (PFTTrDA)	12.6	2.0	ng/L	9.86		127	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.26	2.0	ng/L	9.22		100	63-143			
Perfluorodecanesulfonic acid (PFDS)	8.92	2.0	ng/L	9.52		93.7	53-142			
Perfluorooctanesulfonamide (FOSA)	10.3	2.0	ng/L	9.86		105	67-137			
Perfluorononanesulfonic acid (PFNS)	8.38	2.0	ng/L	9.47		88.5	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	9.36	2.0	ng/L	9.86		94.9	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	8.85	2.0	ng/L	9.86		89.7	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	8.75	2.0	ng/L	9.03		96.9	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	9.05	2.0	ng/L	9.86		91.8	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	8.44	2.0	ng/L	9.86		85.6	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	8.63	2.0	ng/L	9.37		92.1	64-140			
Perfluoropentanesulfonic acid (PFPeS)	9.26	2.0	ng/L	9.27		99.8	71-127			
Perfluoroundecanoic acid (PFUnA)	10.1	2.0	ng/L	9.86		103	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.7	2.0	ng/L	9.86		109	58.5-143			
Perfluoroheptanoic acid (PFHpA)	9.88	2.0	ng/L	9.86		100	72-130			
Perfluorooctanoic acid (PFOA)	9.44	2.0	ng/L	9.86		95.7	71-133			
Perfluorooctanesulfonic acid (PFOS)	9.45	2.0	ng/L	9.12		104	65-140			
Perfluorononanoic acid (PFNA)	9.48	2.0	ng/L	9.86		96.1	69-130			

Matrix Spike (B338155-MS1)

Source: 23D2524-02

Prepared: 04/26/23 Analyzed: 04/28/23

Perfluorobutanoic acid (PFBA)	13.7	1.8	ng/L	8.77	4.49	105	73-129			
Perfluorobutanesulfonic acid (PFBS)	7.75	1.8	ng/L	7.76	ND	99.9	72-130			
Perfluoropentanoic acid (PFPeA)	11.5	1.8	ng/L	8.77	2.60	101	72-129			
Perfluorohexanoic acid (PFHxA)	10.5	1.8	ng/L	8.77	1.56	102	72-129			
11Cl-PF3OUdS (F53B Major)	7.26	1.8	ng/L	8.26	ND	87.9	58.3-140			
9Cl-PF3ONS (F53B Minor)	7.57	1.8	ng/L	8.17	ND	92.7	61.4-144			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.29	1.8	ng/L	8.26	ND	100	62.4-128			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.17	1.8	ng/L	8.77	ND	105	36.7-171			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	8.88	1.8	ng/L	8.42	ND	105	67-138			
Perfluorodecanoic acid (PFDA)	9.19	1.8	ng/L	8.77	ND	105	71-129			
Perfluorododecanoic acid (PFDoA)	9.70	1.8	ng/L	8.77	ND	111	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	7.32	1.8	ng/L	7.80	ND	93.8	54.3-149			
Perfluoroheptanesulfonic acid (PFHpS)	8.29	1.8	ng/L	8.37	ND	99.0	69-134			
N-EtFOSAA (NEtFOSAA)	9.04	1.8	ng/L	8.77	ND	103	61-135			
N-MeFOSAA (NMeFOSAA)	9.53	1.8	ng/L	8.77	ND	109	65-136			
Perfluorotetradecanoic acid (PFTA)	9.12	1.8	ng/L	8.77	ND	104	71-132			
Perfluorotridecanoic acid (PFTTrDA)	8.94	1.8	ng/L	8.77	ND	102	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.07	1.8	ng/L	8.20	ND	98.4	63-143			
Perfluorodecanesulfonic acid (PFDS)	7.80	1.8	ng/L	8.46	ND	92.2	53-142			
Perfluorooctanesulfonamide (FOSA)	9.11	1.8	ng/L	8.77	ND	104	67-137			
Perfluorononanesulfonic acid (PFNS)	7.53	1.8	ng/L	8.42	ND	89.5	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	8.16	1.8	ng/L	8.77	ND	93.1	64.2-154			
Perfluoro-1-butanefulfonamide (FBSA)	7.97	1.8	ng/L	8.77	ND	90.9	65.9-140			
Perfluorohexanesulfonic acid (PFHxS)	8.09	1.8	ng/L	8.02	ND	101	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	8.11	1.8	ng/L	8.77	ND	92.5	61.9-143			
Perfluoro-5-oxahexanoic acid (PFMBA)	7.49	1.8	ng/L	8.77	ND	85.4	61.4-142			

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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 B338155 - SOP 454-PFAAS

Matrix Spike (B338155-MS1)		Source: 23D2524-02		Prepared: 04/26/23		Analyzed: 04/28/23				
6:2 Fluorotelomersulfonic acid (6:2FTS A)	8.84	1.8	ng/L	8.33	ND	106	64-140			
Perfluoropetanesulfonic acid (PFPeS)	8.16	1.8	ng/L	8.24	ND	99.0	71-127			
Perfluoroundecanoic acid (PFUnA)	9.14	1.8	ng/L	8.77	ND	104	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	8.87	1.8	ng/L	8.77	ND	101	62-138			
Perfluoroheptanoic acid (PFHpA)	9.21	1.8	ng/L	8.77	ND	105	72-130			
Perfluorooctanoic acid (PFOA)	8.92	1.8	ng/L	8.77	ND	102	71-133			
Perfluorooctanesulfonic acid (PFOS)	9.93	1.8	ng/L	8.11	0.883	112	65-140			
Perfluorononanoic acid (PFNA)	8.45	1.8	ng/L	8.77	ND	96.3	69-130			

Matrix Spike Dup (B338155-MSD1)		Source: 23D2524-02		Prepared: 04/26/23		Analyzed: 04/28/23				
Perfluorobutanoic acid (PFBA)	14.4	1.8	ng/L	8.86	4.49	112	73-129	5.06	30	
Perfluorobutanesulfonic acid (PFBS)	8.29	1.8	ng/L	7.84	ND	106	72-130	6.67	30	
Perfluoropentanoic acid (PFPeA)	12.1	1.8	ng/L	8.86	2.60	108	72-129	5.87	30	
Perfluorohexanoic acid (PFHxA)	11.4	1.8	ng/L	8.86	1.56	111	72-129	7.55	30	
11Cl-PF3OUdS (F53B Major)	7.93	1.8	ng/L	8.35	ND	95.0	58.3-140	8.83	30	
9Cl-PF3ONS (F53B Minor)	8.80	1.8	ng/L	8.26	ND	107	61.4-144	15.0	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.21	1.8	ng/L	8.35	ND	98.3	62.4-128	1.01	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	10.5	1.8	ng/L	8.86	ND	118	36.7-171	13.4	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.40	1.8	ng/L	8.51	ND	110	67-138	5.72	30	
Perfluorodecanoic acid (PFDA)	8.87	1.8	ng/L	8.86	ND	100	71-129	3.56	30	
Perfluorododecanoic acid (PFDoA)	9.23	1.8	ng/L	8.86	ND	104	72-134	5.01	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	7.85	1.8	ng/L	7.89	ND	99.5	54.3-149	6.98	30	
Perfluoroheptanesulfonic acid (PFHpS)	7.81	1.8	ng/L	8.47	ND	92.3	69-134	5.91	30	
N-EtFOSAA (NEtFOSAA)	9.86	1.8	ng/L	8.86	ND	111	61-135	8.74	30	
N-MeFOSAA (NMeFOSAA)	11.1	1.8	ng/L	8.86	ND	126	65-136	15.6	30	
Perfluorotetradecanoic acid (PFTA)	9.83	1.8	ng/L	8.86	ND	111	71-132	7.39	30	
Perfluorotridecanoic acid (PFTrDA)	11.1	1.8	ng/L	8.86	ND	126	65-144	21.9	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.59	1.8	ng/L	8.29	ND	104	63-143	6.31	30	
Perfluorodecanesulfonic acid (PFDS)	8.49	1.8	ng/L	8.55	ND	99.3	53-142	8.55	30	
Perfluorooctanesulfonamide (FOSA)	9.97	1.8	ng/L	8.86	ND	112	67-137	8.94	30	
Perfluorononanesulfonic acid (PFNS)	9.29	1.8	ng/L	8.51	ND	109	69-127	20.8	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	10.0	1.8	ng/L	8.86	ND	113	64.2-154	20.2	30	
Perfluoro-1-butanedisulfonamide (FBSA)	8.30	1.8	ng/L	8.86	ND	93.6	65.9-140	4.05	30	
Perfluorohexanesulfonic acid (PFHxS)	9.41	1.8	ng/L	8.11	ND	116	68-131	15.1	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	8.87	1.8	ng/L	8.86	ND	100	61.9-143	8.94	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	7.82	1.8	ng/L	8.86	ND	88.3	61.4-142	4.36	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	9.28	1.8	ng/L	8.42	ND	110	64-140	4.81	30	
Perfluoropetanesulfonic acid (PFPeS)	8.42	1.8	ng/L	8.33	ND	101	71-127	3.08	30	
Perfluoroundecanoic acid (PFUnA)	9.64	1.8	ng/L	8.86	ND	109	69-133	5.33	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.8	1.8	ng/L	8.86	ND	122	62-138	19.8	30	
Perfluoroheptanoic acid (PFHpA)	9.91	1.8	ng/L	8.86	ND	112	72-130	7.36	30	
Perfluorooctanoic acid (PFOA)	9.38	1.8	ng/L	8.86	ND	106	71-133	5.03	30	
Perfluorooctanesulfonic acid (PFOS)	9.82	1.8	ng/L	8.20	0.883	109	65-140	1.16	30	
Perfluorononanoic acid (PFNA)	10.2	1.8	ng/L	8.86	ND	115	69-130	18.5	30	

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332**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.
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.
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
INF (PRW-4) (23D2524-01) Lab File ID: 23D2524-01.d Analyzed: 04/28/23 07:38									
M8FOSA	153006.1	4.052516	229,751.00	4.052516	67	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	41387.53	2.5543	63,052.00	2.5461	66	50 - 150	0.0082	+/-0.50	
M2PFTA	408276.7	4.32155	625,482.00	4.32155	65	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	156521.9	3.81075	36,800.00	3.81075	425	50 - 150	0.0000	+/-0.50	*
MPFBA	330693.9	1.100017	413,982.00	1.100017	80	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	114599.6	2.8884	127,387.00	2.880217	90	50 - 150	0.0082	+/-0.50	
M6PFDA	377925.3	3.811283	434,091.00	3.811283	87	50 - 150	0.0000	+/-0.50	
M3PFBS	114868.6	1.944683	132,489.00	1.944683	87	50 - 150	0.0000	+/-0.50	
M7PFUnA	326783.2	3.954017	435,821.00	3.954017	75	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	45146.93	3.469383	32,472.00	3.469383	139	50 - 150	0.0000	+/-0.50	
M5PFPeA	285618.2	1.766017	326,410.00	1.766017	88	50 - 150	0.0000	+/-0.50	
M5PFHxA	495843	2.638533	600,288.00	2.638533	83	50 - 150	0.0000	+/-0.50	
M3PFHxS	84240.66	3.242583	102,169.00	3.242583	82	50 - 150	0.0000	+/-0.50	
M4PFHpA	526419.4	3.21145	635,701.00	3.21145	83	50 - 150	0.0000	+/-0.50	
M8PFOA	486785.9	3.4779	615,023.00	3.4779	79	50 - 150	0.0000	+/-0.50	
M8PFOS	64623.8	3.668117	80,318.00	3.660133	80	50 - 150	0.0080	+/-0.50	
M9PFNA	327480.9	3.66915	485,671.00	3.661167	67	50 - 150	0.0080	+/-0.50	
MPFDoA	317331.5	4.088634	427,448.00	4.088634	74	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	64484.48	3.961483	101,283.00	3.961483	64	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	71235.93	3.889733	100,758.00	3.889733	71	50 - 150	0.0000	+/-0.50	
INF (PRW-4) (23D2524-01RE1) Lab File ID: 23D2524-01RE1.d Analyzed: 05/02/23 10:43									
M8PFOS	66973.44	3.660133	60,383.00	3.660133	111	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
System #1 Mid (23D2524-02)		Lab File ID: 23D2524-02.d				Analyzed: 04/28/23 07:46			
M8FOSA	171592.1	4.052516	229,751.00	4.052516	75	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	37403.97	2.5543	63,052.00	2.5461	59	50 - 150	0.0082	+/-0.50	
M2PFTA	463877.2	4.32155	625,482.00	4.32155	74	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	163993.3	3.81075	36,800.00	3.81075	446	50 - 150	0.0000	+/-0.50	*
MPFBA	364198.4	1.100017	413,982.00	1.100017	88	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	120540.3	2.8884	127,387.00	2.880217	95	50 - 150	0.0082	+/-0.50	
M6PFDA	405804.7	3.811283	434,091.00	3.811283	93	50 - 150	0.0000	+/-0.50	
M3PFBS	121205.9	1.944683	132,489.00	1.944683	91	50 - 150	0.0000	+/-0.50	
M7PFUnA	380027.6	3.954017	435,821.00	3.954017	87	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	23502.98	3.469383	32,472.00	3.469383	72	50 - 150	0.0000	+/-0.50	
M5PFPeA	307628.6	1.766017	326,410.00	1.766017	94	50 - 150	0.0000	+/-0.50	
M5PFHxA	526028.3	2.638533	600,288.00	2.638533	88	50 - 150	0.0000	+/-0.50	
M3PFHxS	80963.92	3.242583	102,169.00	3.242583	79	50 - 150	0.0000	+/-0.50	
M4PFHpA	516320	3.21145	635,701.00	3.21145	81	50 - 150	0.0000	+/-0.50	
M8PFOA	527989.9	3.4779	615,023.00	3.4779	86	50 - 150	0.0000	+/-0.50	
M8PFOS	69216.4	3.660133	80,318.00	3.660133	86	50 - 150	0.0000	+/-0.50	
M9PFNA	364799.6	3.661167	485,671.00	3.661167	75	50 - 150	0.0000	+/-0.50	
MPFDoA	328025.3	4.088634	427,448.00	4.088634	77	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	76196.93	3.961483	101,283.00	3.961483	75	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	74824.4	3.889733	100,758.00	3.889733	74	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
System #1 Eff (23D2524-03)		Lab File ID: 23D2524-03.d				Analyzed: 04/28/23 07:53			
M8FOSA	174722.9	4.052516	229,751.00	4.052516	76	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	37939.47	2.5543	63,052.00	2.5461	60	50 - 150	0.0082	+/-0.50	
M2PF _{TA}	447929.7	4.32155	625,482.00	4.32155	72	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	143091.5	3.81075	36,800.00	3.81075	389	50 - 150	0.0000	+/-0.50	*
MPFBA	424914.6	1.100017	413,982.00	1.100017	103	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	132203.3	2.8884	127,387.00	2.880217	104	50 - 150	0.0082	+/-0.50	
M6PFDA	437322.2	3.811283	434,091.00	3.811283	101	50 - 150	0.0000	+/-0.50	
M3PFBS	129758.8	1.95315	132,489.00	1.944683	98	50 - 150	0.0085	+/-0.50	
M7PFUnA	375583.8	3.954017	435,821.00	3.954017	86	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	30878.19	3.469383	32,472.00	3.469383	95	50 - 150	0.0000	+/-0.50	
M5PFPeA	332841.3	1.766017	326,410.00	1.766017	102	50 - 150	0.0000	+/-0.50	
M5PFHxA	570971.2	2.638533	600,288.00	2.638533	95	50 - 150	0.0000	+/-0.50	
M3PFHxS	98834.85	3.250667	102,169.00	3.242583	97	50 - 150	0.0081	+/-0.50	
M4PFHpA	592579.8	3.21145	635,701.00	3.21145	93	50 - 150	0.0000	+/-0.50	
M8PFOA	544763.6	3.4779	615,023.00	3.4779	89	50 - 150	0.0000	+/-0.50	
M8PFOS	75931.72	3.660133	80,318.00	3.660133	95	50 - 150	0.0000	+/-0.50	
M9PFNA	412144.7	3.661167	485,671.00	3.661167	85	50 - 150	0.0000	+/-0.50	
MPFDoA	334542.9	4.088634	427,448.00	4.088634	78	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	71434.8	3.961483	101,283.00	3.961483	71	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	84206.16	3.889733	100,758.00	3.889733	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
System #2 Mid (23D2524-04) Lab File ID: 23D2524-04.d Analyzed: 04/28/23 08:00									
M8FOSA	150594.6	4.0525	229,751.00	4.052516	66	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	32075.69	2.5543	63,052.00	2.5461	51	50 - 150	0.0082	+/-0.50	
M2PF _{TA}	378913.5	4.32155	625,482.00	4.32155	61	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	119694.4	3.81075	36,800.00	3.81075	325	50 - 150	0.0000	+/-0.50	*
MPFBA	363674.5	1.100017	413,982.00	1.100017	88	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	131324.8	2.8884	127,387.00	2.880217	103	50 - 150	0.0082	+/-0.50	
M6PFDA	353811.2	3.811283	434,091.00	3.811283	82	50 - 150	0.0000	+/-0.50	
M3PFBS	106847.2	1.944683	132,489.00	1.944683	81	50 - 150	0.0000	+/-0.50	
M7PFUnA	305193.5	3.954017	435,821.00	3.954017	70	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	23026.12	3.469383	32,472.00	3.469383	71	50 - 150	0.0000	+/-0.50	
M5PFPeA	279770	1.766017	326,410.00	1.766017	86	50 - 150	0.0000	+/-0.50	
M5PFHxA	469755.3	2.638533	600,288.00	2.638533	78	50 - 150	0.0000	+/-0.50	
M3PFHxS	76347.2	3.242583	102,169.00	3.242583	75	50 - 150	0.0000	+/-0.50	
M4PFHpA	508094.3	3.21145	635,701.00	3.21145	80	50 - 150	0.0000	+/-0.50	
M8PFOA	443657.3	3.4779	615,023.00	3.4779	72	50 - 150	0.0000	+/-0.50	
M8PFOS	58189.61	3.660133	80,318.00	3.660133	72	50 - 150	0.0000	+/-0.50	
M9PFNA	338626.7	3.66915	485,671.00	3.661167	70	50 - 150	0.0080	+/-0.50	
MPFDoA	269987.3	4.088634	427,448.00	4.088634	63	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	61152.13	3.961483	101,283.00	3.961483	60	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	66393.92	3.889733	100,758.00	3.889733	66	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
System #2 Eff (23D2524-05)		Lab File ID: 23D2524-05.d				Analyzed: 04/28/23 08:07			
M8FOSA	140554.4	4.0525	229,751.00	4.052516	61	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	31084.86	2.5543	63,052.00	2.5461	49	50 - 150	0.0082	+/-0.50	*
M2PF _{TA}	347446.1	4.32155	625,482.00	4.32155	56	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	120468.6	3.81075	36,800.00	3.81075	327	50 - 150	0.0000	+/-0.50	*
MPFBA	347184.7	1.100017	413,982.00	1.100017	84	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	109666.8	2.8884	127,387.00	2.880217	86	50 - 150	0.0082	+/-0.50	
M6PFDA	351803	3.811283	434,091.00	3.811283	81	50 - 150	0.0000	+/-0.50	
M3PFBS	102171.4	1.95315	132,489.00	1.944683	77	50 - 150	0.0085	+/-0.50	
M7PFUnA	295974.9	3.954017	435,821.00	3.954017	68	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	23512.81	3.469383	32,472.00	3.469383	72	50 - 150	0.0000	+/-0.50	
M5PFPeA	262479.1	1.766017	326,410.00	1.766017	80	50 - 150	0.0000	+/-0.50	
M5PFHxA	449011.3	2.638533	600,288.00	2.638533	75	50 - 150	0.0000	+/-0.50	
M3PFHxS	74777.57	3.242583	102,169.00	3.242583	73	50 - 150	0.0000	+/-0.50	
M4PFHpA	478124.3	3.21145	635,701.00	3.21145	75	50 - 150	0.0000	+/-0.50	
M8PFOA	439424.7	3.4779	615,023.00	3.4779	71	50 - 150	0.0000	+/-0.50	
M8PFOS	60333.45	3.668117	80,318.00	3.660133	75	50 - 150	0.0080	+/-0.50	
M9PFNA	328929.5	3.661167	485,671.00	3.661167	68	50 - 150	0.0000	+/-0.50	
MPFDoA	260171.1	4.088634	427,448.00	4.088634	61	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	63200.8	3.961483	101,283.00	3.961483	62	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	63284.36	3.889733	100,758.00	3.889733	63	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 (B338155-BLK1)			Lab File ID: B338155-BLK1.d			Analyzed: 04/28/23 07:02			
M8FOSA	180209	4.0525	229,751.00	4.052516	78	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	54369.28	2.5543	63,052.00	2.5461	86	50 - 150	0.0082	+/-0.50	
M2PFtA	485363.7	4.32155	625,482.00	4.32155	78	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	102667.8	3.81075	36,800.00	3.81075	279	50 - 150	0.0000	+/-0.50	*
MPFBA	410510	1.100017	413,982.00	1.100017	99	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	146748.3	2.8884	127,387.00	2.880217	115	50 - 150	0.0082	+/-0.50	
M6PFDA	439158.7	3.811283	434,091.00	3.811283	101	50 - 150	0.0000	+/-0.50	
M3PFBS	126380.8	1.944683	132,489.00	1.944683	95	50 - 150	0.0000	+/-0.50	
M7PFUnA	379080.4	3.954017	435,821.00	3.954017	87	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	32752.52	3.469383	32,472.00	3.469383	101	50 - 150	0.0000	+/-0.50	
M5PFPeA	325579.4	1.766017	326,410.00	1.766017	100	50 - 150	0.0000	+/-0.50	
M5PFHxA	563545.9	2.638533	600,288.00	2.638533	94	50 - 150	0.0000	+/-0.50	
M3PFHxS	96891.15	3.242583	102,169.00	3.242583	95	50 - 150	0.0000	+/-0.50	
M4PFHpA	594628.8	3.21145	635,701.00	3.21145	94	50 - 150	0.0000	+/-0.50	
M8PFOA	577309.4	3.4779	615,023.00	3.4779	94	50 - 150	0.0000	+/-0.50	
M8PFOS	75485.71	3.660133	80,318.00	3.660133	94	50 - 150	0.0000	+/-0.50	
M9PFNA	446163.5	3.66915	485,671.00	3.661167	92	50 - 150	0.0080	+/-0.50	
MPFDoA	335853.7	4.088634	427,448.00	4.088634	79	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	78304.28	3.961483	101,283.00	3.961483	77	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	83614.66	3.889717	100,758.00	3.889733	83	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 (B338155-BS1) Lab File ID: B338155-BS1.d Analyzed: 04/28/23 06:55									
M8FOSA	173896.1	4.052516	229,751.00	4.052516	76	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	52144.91	2.5543	63,052.00	2.5461	83	50 - 150	0.0082	+/-0.50	
M2PFTA	472543.5	4.32155	625,482.00	4.32155	76	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	148657.9	3.81075	36,800.00	3.81075	404	50 - 150	0.0000	+/-0.50	*
MPFBA	401229.5	1.100017	413,982.00	1.100017	97	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	122584.8	2.8884	127,387.00	2.880217	96	50 - 150	0.0082	+/-0.50	
M6PFDA	442698.8	3.811283	434,091.00	3.811283	102	50 - 150	0.0000	+/-0.50	
M3PFBS	119939.5	1.95315	132,489.00	1.944683	91	50 - 150	0.0085	+/-0.50	
M7PFUnA	369589.2	3.954017	435,821.00	3.954017	85	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	30602.44	3.469383	32,472.00	3.469383	94	50 - 150	0.0000	+/-0.50	
M5PFPeA	311139.5	1.766017	326,410.00	1.766017	95	50 - 150	0.0000	+/-0.50	
M5PFHxA	539427.6	2.638533	600,288.00	2.638533	90	50 - 150	0.0000	+/-0.50	
M3PFHxS	92246.1	3.242583	102,169.00	3.242583	90	50 - 150	0.0000	+/-0.50	
M4PFHpA	582918.4	3.21145	635,701.00	3.21145	92	50 - 150	0.0000	+/-0.50	
M8PFOA	550190.6	3.4779	615,023.00	3.4779	89	50 - 150	0.0000	+/-0.50	
M8PFOS	72699.85	3.668117	80,318.00	3.660133	91	50 - 150	0.0080	+/-0.50	
M9PFNA	435941.7	3.661167	485,671.00	3.661167	90	50 - 150	0.0000	+/-0.50	
MPFDoA	348035.5	4.088634	427,448.00	4.088634	81	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	74507.9	3.961483	101,283.00	3.961483	74	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	81328.45	3.889733	100,758.00	3.889733	81	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 (B338155-MS1)			Lab File ID: B338155-MS1.d			Analyzed: 04/28/23 07:09			
M8FOSA	167860.2	4.052516	229,751.00	4.052516	73	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	42491.53	2.5543	63,052.00	2.5461	67	50 - 150	0.0082	+/-0.50	
M2PFTA	485301.6	4.32155	625,482.00	4.32155	78	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	145151.7	3.81075	36,800.00	3.81075	394	50 - 150	0.0000	+/-0.50	*
MPFBA	399970	1.100017	413,982.00	1.100017	97	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	119561.6	2.8884	127,387.00	2.880217	94	50 - 150	0.0082	+/-0.50	
M6PFDA	431062.6	3.811283	434,091.00	3.811283	99	50 - 150	0.0000	+/-0.50	
M3PFBS	120841	1.944683	132,489.00	1.944683	91	50 - 150	0.0000	+/-0.50	
M7PFUnA	383222.3	3.954017	435,821.00	3.954017	88	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	28565.91	3.469383	32,472.00	3.469383	88	50 - 150	0.0000	+/-0.50	
M5PFPeA	311274.5	1.766017	326,410.00	1.766017	95	50 - 150	0.0000	+/-0.50	
M5PFHxA	536977.9	2.638533	600,288.00	2.638533	89	50 - 150	0.0000	+/-0.50	
M3PFHxS	95507.75	3.242583	102,169.00	3.242583	93	50 - 150	0.0000	+/-0.50	
M4PFHpA	563967.8	3.21145	635,701.00	3.21145	89	50 - 150	0.0000	+/-0.50	
M8PFOA	541754.3	3.4779	615,023.00	3.4779	88	50 - 150	0.0000	+/-0.50	
M8PFOS	75569.75	3.668117	80,318.00	3.660133	94	50 - 150	0.0080	+/-0.50	
M9PFNA	418432.1	3.661167	485,671.00	3.661167	86	50 - 150	0.0000	+/-0.50	
MPFDoA	328738.6	4.088634	427,448.00	4.088634	77	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	79145.55	3.961483	101,283.00	3.961483	78	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	82977.34	3.889733	100,758.00	3.889733	82	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 Dup (B338155-MSD1)			Lab File ID: B338155-MSD1.d			Analyzed: 04/28/23 07:17			
M8FOSA	168945.6	4.052516	229,751.00	4.052516	74	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	40937.08	2.5543	63,052.00	2.5461	65	50 - 150	0.0082	+/-0.50	
M2PFTA	400386	4.32155	625,482.00	4.32155	64	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	163346.8	3.81075	36,800.00	3.81075	444	50 - 150	0.0000	+/-0.50	*
MPFBA	406654.5	1.100017	413,982.00	1.100017	98	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	122176.1	2.8884	127,387.00	2.880217	96	50 - 150	0.0082	+/-0.50	
M6PFDA	446094.8	3.811283	434,091.00	3.811283	103	50 - 150	0.0000	+/-0.50	
M3PFBS	120488.5	1.95315	132,489.00	1.944683	91	50 - 150	0.0085	+/-0.50	
M7PFUnA	378487.4	3.954017	435,821.00	3.954017	87	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	25677.75	3.469383	32,472.00	3.469383	79	50 - 150	0.0000	+/-0.50	
M5PFPeA	323401.3	1.766017	326,410.00	1.766017	99	50 - 150	0.0000	+/-0.50	
M5PFHxA	524848.5	2.638533	600,288.00	2.638533	87	50 - 150	0.0000	+/-0.50	
M3PFHxS	88200.14	3.242583	102,169.00	3.242583	86	50 - 150	0.0000	+/-0.50	
M4PFHpA	566364.3	3.21145	635,701.00	3.21145	89	50 - 150	0.0000	+/-0.50	
M8PFOA	491070.9	3.4779	615,023.00	3.4779	80	50 - 150	0.0000	+/-0.50	
M8PFOS	72080.8	3.660133	80,318.00	3.660133	90	50 - 150	0.0000	+/-0.50	
M9PFNA	397381.4	3.661167	485,671.00	3.661167	82	50 - 150	0.0000	+/-0.50	
MPFDoA	344150.1	4.088634	427,448.00	4.088634	81	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	75181.88	3.961483	101,283.00	3.961483	74	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	79018.26	3.889733	100,758.00	3.889733	78	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
Perfluorobutanesulfonic acid (PFBS)	NH-P
Perfluoropentanoic acid (PFPeA)	NH-P
Perfluorohexanoic acid (PFHxA)	NH-P
11Cl-PF3OUdS (F53B Major)	NH-P
9Cl-PF3ONS (F53B Minor)	NH-P
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P
Perfluorodecanoic acid (PFDA)	NH-P
Perfluorododecanoic acid (PFDoA)	NH-P
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P
Perfluoroheptanesulfonic acid (PFHpS)	NH-P
N-EtFOSAA (NEtFOSAA)	NH-P
N-MeFOSAA (NMeFOSAA)	NH-P
Perfluorotetradecanoic acid (PFTA)	NH-P
Perfluorotridecanoic acid (PFTrDA)	NH-P
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P
Perfluorodecanesulfonic acid (PFDS)	NH-P
Perfluorooctanesulfonamide (FOSA)	NH-P
Perfluorononanesulfonic acid (PFNS)	NH-P
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P
Perfluoro-1-butanedisulfonamide (FBSA)	NH-P
Perfluorohexanesulfonic acid (PFHxS)	NH-P
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P
Perfluoropentanesulfonic acid (PFPeS)	NH-P
Perfluoroundecanoic acid (PFUnA)	NH-P
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P
Perfluoroheptanoic acid (PFHpA)	NH-P
Perfluorooctanoic acid (PFOA)	NH-P
Perfluorooctanesulfonic acid (PFOS)	NH-P
Perfluorononanoic acid (PFNA)	NH-P

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



Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com

Barnstable County
3195 Main St. PO Box 427

Project Name: BFTA
Project Location: Barnstable, MA
Project Number: 6206
Project Manager: Roger Thibault

Con-Test Quote Name/Number:
Invoice Recipient: Priscilla Ellis - pellis@barnstablecounty.org
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 1 of 1

ANALYSIS REQUESTED

Requested Turnaround Time: ☐ 7 Day ☐ 10 Day ☐ 15 Day (std) ☒ Due Date: ☐ Rush Approval Required ☐

1-Day ☐ 3-Day ☐ 2-Day ☐ 4-Day ☐ Field Filtered Lab to Filter

Orthophosphate Samples

Format: PDF ☒ EXCEL ☒ SOXHLET ☐ NON SOXHLET ☐

CLP Like Data Pkg Required: ☐ Email To: ☐ Fax To #: ☐

Beginning Date/Time: 4-18-23 7:00

Client Sample ID / Description: INF (PRW-4)

Ending Date/Time: 4-18-23 7:10

System #1 Mid

System #1 Eff

System #2 Mid

System #2 Eff

System #1 Mid MS/MSD*

System #1 Mid MS/MSD*

System #1 Mid MS/MSD*

System #1 Mid MS/MSD*

System #1 Mid MS/MSD*

System #1 Mid MS/MSD*

System #1 Mid MS/MSD*

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Relinquished by: (signature) Date/Time: 4/18/23 16:00

Received by: (signature) Date/Time: 4/18/23 16:00

Relinquished by: (signature) Date/Time: 4/18/23 16:00

Received by: (signature) Date/Time: 4/18/23 16:00

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Received by: (signature) Date/Time: 4/18/23 16:00

Relinquished by: (signature) Date/Time: 4/18/23 16:00

Received by: (signature) Date/Time: 4/18/23 16:00

Client Comments: *Lab requested MS/MSD. Sample confirmation and report to Rthibault@BETA-inc.com & Lbouley@BETA-inc.com

MA MCP Required ☒ MA State DW Required ☐

MA State DW Required ☐

MA State DW Required ☐

MA State DW Required ☐

MA State DW Required ☐

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MA State DW Required ☐

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MA MCP Required ☒

MA MCP Required ☐

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MA MCP Required ☐

MA MCP Required ☐

MA MCP Required ☐

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

3 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

4 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

5 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

6 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

7 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

8 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

9 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

10 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

11 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

12 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

13 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

14 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

15 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

East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.pacelabs.com

Log In Back-Sheet

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



Client Barnstable County

Project BETA

MCP/RCP Required _____

Deliverable Package Req. _____

Location Barnstable, MA

PWSID# (When Applicable) _____

Arrival Method:

Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐

Received By / Date / Time CH 4-21-23 17:44

Back-Sheet By / Date / Time CH 4-24-23 11:50

Temperature Method Cu # 3

Temp ☒ < 6° C Actual Temperature 4.0

Rush Samples: Yes ☐ No ☒ Notify _____

Short Hold: Yes ☐ No ☒ Notify _____

Notes regarding Samples/COC outside of SOP:

	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 ☐ ☐

Container (Circle when applicable)			UnP	HCl	HNO3	H2SO4	NaOH	Trizma	Na2S2O3	Other Preservative
1L	Amber	Plastic								
500 mL	Amber	Plastic								
250 mL	Amber	Plastic	<u>12</u>							
Other	Amber	Clear Plastic								
16oz	Amber	Clear								
8oz	Amber	Clear								
4oz	Amber	Clear								
2oz	Amber	Clear								
Col/Bacteria										
Flashpoint										
Plastic Bag										
SOC Kit										
Perchlorate										
Encore										
Frozen										
Proper Headspace			UnP	HCl	MeOH	Bisulfate	DI	Thiosulfate	Sulfuric	Other
Vials										

May 30, 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: 23E1951

Enclosed are results of analyses for samples as received by the laboratory on May 15, 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: 5/30/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23E1951

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)	23E1951-01	Ground Water		SOP-454 PFAS	
System #1 Mid	23E1951-02	Ground Water		SOP-454 PFAS	
System #1 Eff	23E1951-03	Ground Water		SOP-454 PFAS	
System #2 Mid	23E1951-04	Ground Water		SOP-454 PFAS	
System #2 Eff	23E1951-05	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:****D-01**

Sample extracted/prepared at a dilution due to sample matrix interference.

Analyte & Samples(s) Qualified:

23E1951-01[INF (PRW-4)], 23E1951-02[System #1 Mid], 23E1951-04[System #2 Mid], B340691-MS1, B340691-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:**M2-8:2FTS**

23E1951-03[System #1 Eff], 23E1951-05[System #2 Eff]

S-29

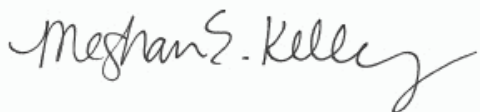
Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**M2-8:2FTS**

S088143-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.



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: 23E1951

Date Received: 5/15/2023

Field Sample #: INF (PRW-4)

Sampled: 5/11/2023 13:10

Sample ID: 23E1951-01

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)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorobutanesulfonic acid (PFBS)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluoropentanoic acid (PFPeA)	95	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorohexanoic acid (PFHxA)	100	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
11Cl-PF3OUdS (F53B Major)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
9Cl-PF3ONS (F53B Minor)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorodecanoic acid (PFDA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorododecanoic acid (PFDoA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluoroheptanesulfonic acid (PFHpS)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
N-EtFOSAA (NEtFOSAA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
N-MeFOSAA (NMeFOSAA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorotetradecanoic acid (PFTA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorotridecanoic acid (PFTTrDA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorodecanesulfonic acid (PFDS)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorooctanesulfonamide (FOSA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorononanesulfonic acid (PFNS)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluoro-1-butanefulfonamide (FBFA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorohexanesulfonic acid (PFHxS)	160	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
6:2 Fluorotelomersulfonic acid (6:2FTS A)	140	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluoropentanesulfonic acid (PFPeS)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluoroundecanoic acid (PFUnA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluoroheptanoic acid (PFHpA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorooctanoic acid (PFOA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorooctanesulfonic acid (PFOS)	310	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2
Perfluorononanoic acid (PFNA)	ND	50	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:13	JR2

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23E1951

Date Received: 5/15/2023

Field Sample #: System #1 Mid

Sampled: 5/11/2023 13:20

Sample ID: 23E1951-02

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)	6.4	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorobutanesulfonic acid (PFBS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluoropentanoic acid (PFPeA)	4.5	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorohexanoic acid (PFHxA)	5.1	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorodecanoic acid (PFDA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorododecanoic acid (PFDoA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluoroheptanesulfonic acid (PFHpS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
N-EtFOSAA (NEtFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
N-MeFOSAA (NMeFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorotetradecanoic acid (PFTA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorotridecanoic acid (PFTTrDA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorodecanesulfonic acid (PFDS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorooctanesulfonamide (FOSA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorononanesulfonic acid (PFNS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluoro-1-butanefulfonamide (FBFA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorohexanesulfonic acid (PFHxS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluoropentanesulfonic acid (PFPeS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluoroundecanoic acid (PFUnA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Nonfluoro-3,6-dioxahexanoic acid (NFDHA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluoroheptanoic acid (PFHpA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorooctanoic acid (PFOA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorooctanesulfonic acid (PFOS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2
Perfluorononanoic acid (PFNA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:20	JR2

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23E1951

Date Received: 5/15/2023

Field Sample #: System #1 Eff

Sampled: 5/11/2023 13:15

Sample ID: 23E1951-03

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	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluoropentanoic acid (PFPeA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluoroheptanesulfonic acid (PFHpS)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
N-EtFOSAA (NEtFOSAA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
N-MeFOSAA (NMeFOSAA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorotridecanoic acid (PFTTrDA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorodecanesulfonic acid (PFDS)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorooctanesulfonamide (FOSA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorononanesulfonic acid (PFNS)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluoro-1-butanesulfonamide (FBSA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluoropetanesulfonic acid (PFPeS)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:28	JR2

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23E1951

Date Received: 5/15/2023

Field Sample #: System #2 Mid

Sampled: 5/11/2023 13:45

Sample ID: 23E1951-04

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	5/24/23	5/26/23 5:35	JR2
Perfluorobutanesulfonic acid (PFBS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluoropentanoic acid (PFPeA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorohexanoic acid (PFHxA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorodecanoic acid (PFDA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorododecanoic acid (PFDoA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluoroheptanesulfonic acid (PFHpS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
N-EtFOSAA (NEtFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
N-MeFOSAA (NMeFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorotetradecanoic acid (PFTA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorotridecanoic acid (PFTTrDA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorodecanesulfonic acid (PFDS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorooctanesulfonamide (FOSA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorononanesulfonic acid (PFNS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluoro-1-butanesulfonamide (FBSA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorohexanesulfonic acid (PFHxS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluoropentanesulfonic acid (PFPeS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluoroundecanoic acid (PFUnA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluoroheptanoic acid (PFHpA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorooctanoic acid (PFOA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorooctanesulfonic acid (PFOS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2
Perfluorononanoic acid (PFNA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:35	JR2

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23E1951

Date Received: 5/15/2023

Field Sample #: System #2 Eff

Sampled: 5/11/2023 13:30

Sample ID: 23E1951-05

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	5/24/23	5/26/23 5:42	JR2
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluoro-1-butanesulfonamide (FBSA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	5/24/23	5/26/23 5:42	JR2

Sample Extraction Data

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23E1951-01 [INF (PRW-4)]	B340691	10.0	1.00	05/24/23
23E1951-02 [System #1 Mid]	B340691	122	1.00	05/24/23
23E1951-03 [System #1 Eff]	B340691	254	1.00	05/24/23
23E1951-04 [System #2 Mid]	B340691	121	1.00	05/24/23
23E1951-05 [System #2 Eff]	B340691	273	1.00	05/24/23

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

Batch B340691 - SOP 454-PFAAS
Blank (B340691-BLK1)

Prepared: 05/24/23 Analyzed: 05/26/23

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 (B340691-BS1)

Prepared: 05/24/23 Analyzed: 05/26/23

Perfluorobutanoic acid (PFBA)	8.99	2.0	ng/L	9.90	90.7	73-129
Perfluorobutanesulfonic acid (PFBS)	7.65	2.0	ng/L	8.77	87.2	72-130
Perfluoropentanoic acid (PFPeA)	8.87	2.0	ng/L	9.90	89.5	72-129
Perfluorohexanoic acid (PFHxA)	8.91	2.0	ng/L	9.90	90.0	72-129
11Cl-PF3OUdS (F53B Major)	6.98	2.0	ng/L	9.33	74.8	55.1-141
9Cl-PF3ONS (F53B Minor)	8.05	2.0	ng/L	9.23	87.2	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.30	2.0	ng/L	9.33	88.9	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.70	2.0	ng/L	9.90	87.8	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	7.64	2.0	ng/L	9.51	80.4	67-138
Perfluorodecanoic acid (PFDA)	8.61	2.0	ng/L	9.90	87.0	71-129
Perfluorododecanoic acid (PFDoA)	8.52	2.0	ng/L	9.90	86.0	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	7.63	2.0	ng/L	8.81	86.5	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

Batch B340691 - SOP 454-PFAAS
LCS (B340691-BS1)

Prepared: 05/24/23 Analyzed: 05/26/23

Perfluoroheptanesulfonic acid (PFHpS)	8.50	2.0	ng/L	9.46		89.8	69-134			
N-EtFOSAA (NEtFOSAA)	8.22	2.0	ng/L	9.90		83.0	61-135			
N-MeFOSAA (NMeFOSAA)	9.15	2.0	ng/L	9.90		92.4	65-136			
Perfluorotetradecanoic acid (PFTA)	8.82	2.0	ng/L	9.90		89.0	71-132			
Perfluorotridecanoic acid (PFTTrDA)	10.5	2.0	ng/L	9.90		106	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.30	2.0	ng/L	9.26		89.7	63-143			
Perfluorodecanesulfonic acid (PFDS)	6.13	2.0	ng/L	9.56		64.1	53-142			
Perfluorooctanesulfonamide (FOSA)	8.33	2.0	ng/L	9.90		84.1	67-137			
Perfluorononanesulfonic acid (PFNS)	8.73	2.0	ng/L	9.51		91.8	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	7.25	2.0	ng/L	9.90		73.2	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	7.74	2.0	ng/L	9.90		78.2	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	8.27	2.0	ng/L	9.06		91.2	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	8.36	2.0	ng/L	9.90		84.5	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	8.78	2.0	ng/L	9.90		88.6	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	7.99	2.0	ng/L	9.41		84.9	64-140			
Perfluoropentanesulfonic acid (PFPeS)	8.18	2.0	ng/L	9.31		87.8	71-127			
Perfluoroundecanoic acid (PFUnA)	9.31	2.0	ng/L	9.90		94.0	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.08	2.0	ng/L	9.90		91.7	58.5-143			
Perfluoroheptanoic acid (PFHpA)	8.91	2.0	ng/L	9.90		90.0	72-130			
Perfluorooctanoic acid (PFOA)	8.73	2.0	ng/L	9.90		88.2	71-133			
Perfluorooctanesulfonic acid (PFOS)	8.05	2.0	ng/L	9.16		87.9	65-140			
Perfluorononanoic acid (PFNA)	7.30	2.0	ng/L	9.90		73.7	69-130			

Matrix Spike (B340691-MS1)
Source: 23E1951-01

Prepared: 05/24/23 Analyzed: 05/26/23

D-01

Perfluorobutanoic acid (PFBA)	266	50	ng/L	250	30.5	94.3	73-129			
Perfluorobutanesulfonic acid (PFBS)	214	50	ng/L	221	ND	96.7	72-130			
Perfluoropentanoic acid (PFPeA)	328	50	ng/L	250	94.8	93.2	72-129			
Perfluorohexanoic acid (PFHxA)	335	50	ng/L	250	100	94.0	72-129			
11Cl-PF3OUdS (F53B Major)	177	50	ng/L	236	ND	75.1	58.3-140			
9Cl-PF3ONS (F53B Minor)	215	50	ng/L	233	ND	92.1	61.4-144			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	224	50	ng/L	236	ND	95.1	62.4-128			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	227	50	ng/L	250	ND	90.9	36.7-171			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	257	50	ng/L	240	28.8	95.0	67-138			
Perfluorodecanoic acid (PFDA)	233	50	ng/L	250	ND	93.4	71-129			
Perfluorododecanoic acid (PFDoA)	254	50	ng/L	250	ND	102	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	210	50	ng/L	222	ND	94.4	54.3-149			
Perfluoroheptanesulfonic acid (PFHpS)	237	50	ng/L	239	ND	99.4	69-134			
N-EtFOSAA (NEtFOSAA)	214	50	ng/L	250	ND	85.4	61-135			
N-MeFOSAA (NMeFOSAA)	246	50	ng/L	250	ND	98.4	65-136			
Perfluorotetradecanoic acid (PFTA)	233	50	ng/L	250	ND	93.2	71-132			
Perfluorotridecanoic acid (PFTTrDA)	259	50	ng/L	250	ND	104	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	209	50	ng/L	234	ND	89.5	63-143			
Perfluorodecanesulfonic acid (PFDS)	200	50	ng/L	241	ND	83.0	53-142			
Perfluorooctanesulfonamide (FOSA)	231	50	ng/L	250	ND	92.4	67-137			
Perfluorononanesulfonic acid (PFNS)	222	50	ng/L	240	ND	92.5	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	252	50	ng/L	250	46.8	82.0	64.2-154			
Perfluoro-1-butanefulfonamide (FBSA)	227	50	ng/L	250	ND	90.9	65.9-140			
Perfluorohexanesulfonic acid (PFHxS)	352	50	ng/L	229	156	85.7	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	231	50	ng/L	250	ND	92.4	61.9-143			
Perfluoro-5-oxahexanoic acid (PFMBA)	243	50	ng/L	250	ND	97.1	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

Batch B340691 - SOP 454-PFAAS

Matrix Spike (B340691-MS1)	Source: 23E1951-01			Prepared: 05/24/23 Analyzed: 05/26/23				D-01		
6:2 Fluorotelomersulfonic acid (6:2FTS A)	331	50	ng/L	238	135	82.3	64-140			
Perfluoropetanesulfonic acid (PFPeS)	225	50	ng/L	235	ND	95.9	71-127			
Perfluoroundecanoic acid (PFUnA)	287	50	ng/L	250	38.7	99.2	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	245	50	ng/L	250	ND	97.9	62-138			
Perfluoroheptanoic acid (PFHpA)	289	50	ng/L	250	49.3	95.8	72-130			
Perfluorooctanoic acid (PFOA)	261	50	ng/L	250	ND	105	71-133			
Perfluorooctanesulfonic acid (PFOS)	532	50	ng/L	231	312	95.2	65-140			
Perfluorononanoic acid (PFNA)	214	50	ng/L	250	ND	85.7	69-130			

Matrix Spike Dup (B340691-MSD1)	Source: 23E1951-01			Prepared: 05/24/23 Analyzed: 05/26/23				D-01		
Perfluorobutanoic acid (PFBA)	251	50	ng/L	250	30.5	88.1	73-129	6.00	30	
Perfluorobutanesulfonic acid (PFBS)	210	50	ng/L	221	ND	95.0	72-130	1.84	30	
Perfluoropentanoic acid (PFPeA)	320	50	ng/L	250	94.8	90.1	72-129	2.39	30	
Perfluorohexanoic acid (PFHxA)	327	50	ng/L	250	100	90.8	72-129	2.44	30	
11Cl-PF3OUdS (F53B Major)	162	50	ng/L	236	ND	68.7	58.3-140	8.85	30	
9Cl-PF3ONS (F53B Minor)	197	50	ng/L	233	ND	84.7	61.4-144	8.47	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	205	50	ng/L	236	ND	86.9	62.4-128	9.08	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	212	50	ng/L	250	ND	84.7	36.7-171	7.15	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	257	50	ng/L	240	28.8	95.1	67-138	0.0651	30	
Perfluorodecanoic acid (PFDA)	220	50	ng/L	250	ND	88.2	71-129	5.70	30	
Perfluorododecanoic acid (PFDoA)	240	50	ng/L	250	ND	95.8	72-134	5.93	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	199	50	ng/L	222	ND	89.5	54.3-149	5.33	30	
Perfluoroheptanesulfonic acid (PFHpS)	226	50	ng/L	239	ND	94.5	69-134	5.12	30	
N-EtFOSAA (NEtFOSAA)	220	50	ng/L	250	ND	87.8	61-135	2.81	30	
N-MeFOSAA (NMeFOSAA)	227	50	ng/L	250	ND	90.8	65-136	8.07	30	
Perfluorotetradecanoic acid (PFTA)	220	50	ng/L	250	ND	88.0	71-132	5.73	30	
Perfluorotridecanoic acid (PFTrDA)	254	50	ng/L	250	ND	102	65-144	1.81	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	218	50	ng/L	234	ND	93.1	63-143	3.97	30	
Perfluorodecanesulfonic acid (PFDS)	184	50	ng/L	241	ND	76.4	53-142	8.19	30	
Perfluorooctanesulfonamide (FOSA)	220	50	ng/L	250	ND	88.0	67-137	4.87	30	
Perfluorononanesulfonic acid (PFNS)	216	50	ng/L	240	ND	90.1	69-127	2.63	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	241	50	ng/L	250	46.8	77.7	64.2-154	4.42	30	
Perfluoro-1-butanedisulfonamide (FBSA)	219	50	ng/L	250	ND	87.7	65.9-140	3.53	30	
Perfluorohexanesulfonic acid (PFHxS)	349	50	ng/L	229	156	84.5	68-131	0.813	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	219	50	ng/L	250	ND	87.6	61.9-143	5.31	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	227	50	ng/L	250	ND	90.6	61.4-142	6.95	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	334	50	ng/L	238	135	83.5	64-140	0.811	30	
Perfluoropetanesulfonic acid (PFPeS)	221	50	ng/L	235	ND	94.0	71-127	1.98	30	
Perfluoroundecanoic acid (PFUnA)	265	50	ng/L	250	38.7	90.5	69-133	7.96	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	236	50	ng/L	250	ND	94.3	62-138	3.76	30	
Perfluoroheptanoic acid (PFHpA)	271	50	ng/L	250	49.3	88.5	72-130	6.55	30	
Perfluorooctanoic acid (PFOA)	252	50	ng/L	250	ND	101	71-133	3.81	30	
Perfluorooctanesulfonic acid (PFOS)	531	50	ng/L	231	312	94.7	65-140	0.225	30	
Perfluorononanoic acid (PFNA)	210	50	ng/L	250	ND	83.9	69-130	2.13	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 interference.
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.
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) (23E1951-01) Lab File ID: 23E1951-01.d Analyzed: 05/26/23 05:13									
M8FOSA	250244.6	3.9646	311,594.00	3.956617	80	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	48543.15	2.39	47,892.00	2.39	101	50 - 150	0.0000	+/-0.50	
M2PFTA	312836.7	4.23265	411,066.00	4.232666	76	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	45158.52	3.7311	60,386.00	3.7311	75	50 - 150	0.0000	+/-0.50	
MPFBA	241285	1.025233	272,511.00	1.016917	89	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	105191.9	2.7411	125,214.00	2.741117	84	50 - 150	0.0000	+/-0.50	
M6PFDA	439924.2	3.731617	508,266.00	3.731633	87	50 - 150	0.0000	+/-0.50	
M3PFBS	131077.6	1.8038	135,285.00	1.8038	97	50 - 150	0.0000	+/-0.50	
M7PFUnA	366529.6	3.865783	436,530.00	3.865783	84	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	29004.49	3.38025	28,303.00	3.380267	102	50 - 150	0.0000	+/-0.50	
M5PFPeA	256169	1.640383	268,992.00	1.6321	95	50 - 150	0.0083	+/-0.50	
M5PFHxA	425946.7	2.482	453,352.00	2.4738	94	50 - 150	0.0082	+/-0.50	
M3PFHxS	82782.85	3.14535	86,376.00	3.145367	96	50 - 150	0.0000	+/-0.50	
M4PFHpA	424620.3	3.105283	433,015.00	3.1053	98	50 - 150	0.0000	+/-0.50	
M8PFOA	477918.7	3.397033	474,968.00	3.388983	101	50 - 150	0.0080	+/-0.50	
M8PFOS	76258.49	3.5803	86,508.00	3.580317	88	50 - 150	0.0000	+/-0.50	
M9PFNA	445195.6	3.58135	456,753.00	3.58135	97	50 - 150	0.0000	+/-0.50	
MPFDoA	288245	4.000733	357,629.00	4.000733	81	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	111030.4	3.87345	126,371.00	3.87345	88	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	148466.8	3.801517	146,267.00	3.801517	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
System #1 Mid (23E1951-02)		Lab File ID: 23E1951-02.d				Analyzed: 05/26/23 05:20			
M8FOSA	244652.6	3.964617	311,594.00	3.956617	79	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	42350.46	2.39	47,892.00	2.39	88	50 - 150	0.0000	+/-0.50	
M2PFTA	310971.2	4.23265	411,066.00	4.232666	76	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	49090.58	3.7311	60,386.00	3.7311	81	50 - 150	0.0000	+/-0.50	
MPFBA	241885.3	1.025233	272,511.00	1.016917	89	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	103936.4	2.741117	125,214.00	2.741117	83	50 - 150	0.0000	+/-0.50	
M6PFDA	425938.8	3.731617	508,266.00	3.731633	84	50 - 150	0.0000	+/-0.50	
M3PFBS	128809.1	1.8121	135,285.00	1.8038	95	50 - 150	0.0083	+/-0.50	
M7PFUnA	360006.3	3.865783	436,530.00	3.865783	82	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	27890.13	3.38025	28,303.00	3.380267	99	50 - 150	0.0000	+/-0.50	
M5PFPeA	251049.8	1.640383	268,992.00	1.6321	93	50 - 150	0.0083	+/-0.50	
M5PFHxA	425253.4	2.482	453,352.00	2.4738	94	50 - 150	0.0082	+/-0.50	
M3PFHxS	83407.13	3.15345	86,376.00	3.145367	97	50 - 150	0.0081	+/-0.50	
M4PFHpA	418356.2	3.113433	433,015.00	3.1053	97	50 - 150	0.0081	+/-0.50	
M8PFOA	444579.3	3.397033	474,968.00	3.388983	94	50 - 150	0.0080	+/-0.50	
M8PFOS	72505.25	3.5883	86,508.00	3.580317	84	50 - 150	0.0080	+/-0.50	
M9PFNA	435907.6	3.58135	456,753.00	3.58135	95	50 - 150	0.0000	+/-0.50	
MPFDoA	276848.9	4.000733	357,629.00	4.000733	77	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	116930.9	3.87345	126,371.00	3.87345	93	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	151783.3	3.801517	146,267.00	3.801517	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
System #1 Eff (23E1951-03)		Lab File ID: 23E1951-03.d				Analyzed: 05/26/23 05:28			
M8FOSA	255601.9	3.9566	311,594.00	3.956617	82	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	34898.75	2.39	47,892.00	2.39	73	50 - 150	0.0000	+/-0.50	
M2PFTA	334818.2	4.232633	411,066.00	4.232666	81	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	112097.1	3.723117	60,386.00	3.7311	186	50 - 150	-0.0080	+/-0.50	*
MPFBA	239943.4	1.025233	272,511.00	1.016917	88	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	97131.87	2.741117	125,214.00	2.741117	78	50 - 150	0.0000	+/-0.50	
M6PFDA	449570.8	3.7316	508,266.00	3.731633	88	50 - 150	0.0000	+/-0.50	
M3PFBS	126068.5	1.803817	135,285.00	1.8038	93	50 - 150	0.0000	+/-0.50	
M7PFUnA	366863.6	3.865767	436,530.00	3.865783	84	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	26266.24	3.38025	28,303.00	3.380267	93	50 - 150	0.0000	+/-0.50	
M5PFPeA	248727.8	1.640383	268,992.00	1.6321	92	50 - 150	0.0083	+/-0.50	
M5PFHxA	414936.5	2.473783	453,352.00	2.4738	92	50 - 150	0.0000	+/-0.50	
M3PFHxS	78364.8	3.14535	86,376.00	3.145367	91	50 - 150	0.0000	+/-0.50	
M4PFHpA	421854.6	3.105283	433,015.00	3.1053	97	50 - 150	0.0000	+/-0.50	
M8PFOA	435825.9	3.388967	474,968.00	3.388983	92	50 - 150	0.0000	+/-0.50	
M8PFOS	75100.52	3.580283	86,508.00	3.580317	87	50 - 150	0.0000	+/-0.50	
M9PFNA	421663.3	3.581333	456,753.00	3.58135	92	50 - 150	0.0000	+/-0.50	
MPFDoA	282757.8	3.992717	357,629.00	4.000733	79	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	105663.6	3.873433	126,371.00	3.87345	84	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	149403.3	3.793533	146,267.00	3.801517	102	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 (23E1951-04)		Lab File ID: 23E1951-04.d				Analyzed: 05/26/23 05:35			
M8FOSA	249873.4	3.972583	311,594.00	3.956617	80	50 - 150	0.0160	+/-0.50	
M2-4:2FTS	40143.39	2.4146	47,892.00	2.39	84	50 - 150	0.0246	+/-0.50	
M2PFTA	303851.9	4.240716	411,066.00	4.232666	74	50 - 150	0.0080	+/-0.50	
M2-8:2FTS	44147.16	3.73905	60,386.00	3.7311	73	50 - 150	0.0080	+/-0.50	
MPFBA	240534.3	1.033533	272,511.00	1.016917	88	50 - 150	0.0166	+/-0.50	
M3HFPO-DA	100480.6	2.76565	125,214.00	2.741117	80	50 - 150	0.0245	+/-0.50	
M6PFDA	409681.6	3.739567	508,266.00	3.731633	81	50 - 150	0.0079	+/-0.50	
M3PFBS	127511.4	1.820383	135,285.00	1.8038	94	50 - 150	0.0166	+/-0.50	
M7PFUnA	350835.7	3.873933	436,530.00	3.865783	80	50 - 150	0.0082	+/-0.50	
M2-6:2FTS	28010.59	3.3883	28,303.00	3.380267	99	50 - 150	0.0080	+/-0.50	
M5PFPeA	249175.1	1.656917	268,992.00	1.6321	93	50 - 150	0.0248	+/-0.50	
M5PFHxA	416579.5	2.498417	453,352.00	2.4738	92	50 - 150	0.0246	+/-0.50	
M3PFHxS	80959.23	3.1615	86,376.00	3.145367	94	50 - 150	0.0161	+/-0.50	
M4PFHpA	407379.3	3.122317	433,015.00	3.1053	94	50 - 150	0.0170	+/-0.50	
M8PFOA	458314.8	3.405067	474,968.00	3.388983	96	50 - 150	0.0161	+/-0.50	
M8PFOS	70601.91	3.596267	86,508.00	3.580317	82	50 - 150	0.0160	+/-0.50	
M9PFNA	430408.8	3.589317	456,753.00	3.58135	94	50 - 150	0.0080	+/-0.50	
MPFDoA	267362.2	4.008717	357,629.00	4.000733	75	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	106415.8	3.881417	126,371.00	3.87345	84	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	136563.3	3.809467	146,267.00	3.801517	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 (23E1951-05)		Lab File ID: 23E1951-05.d				Analyzed: 05/26/23 05:42			
M8FOSA	249066.5	3.972583	311,594.00	3.956617	80	50 - 150	0.0160	+/-0.50	
M2-4:2FTS	35488.21	2.4146	47,892.00	2.39	74	50 - 150	0.0246	+/-0.50	
M2PFTA	319366.7	4.2407	411,066.00	4.232666	78	50 - 150	0.0080	+/-0.50	
M2-8:2FTS	131467.2	3.73905	60,386.00	3.7311	218	50 - 150	0.0080	+/-0.50	*
MPFBA	241820	1.033533	272,511.00	1.016917	89	50 - 150	0.0166	+/-0.50	
M3HFPO-DA	106863.8	2.76565	125,214.00	2.741117	85	50 - 150	0.0245	+/-0.50	
M6PFDA	454836.7	3.739567	508,266.00	3.731633	89	50 - 150	0.0079	+/-0.50	
M3PFBS	128302.6	1.820383	135,285.00	1.8038	95	50 - 150	0.0166	+/-0.50	
M7PFUnA	360904.8	3.873917	436,530.00	3.865783	83	50 - 150	0.0081	+/-0.50	
M2-6:2FTS	25326.47	3.39635	28,303.00	3.380267	89	50 - 150	0.0161	+/-0.50	
M5PFPeA	248666.7	1.656917	268,992.00	1.6321	92	50 - 150	0.0248	+/-0.50	
M5PFHxA	417857.8	2.498417	453,352.00	2.4738	92	50 - 150	0.0246	+/-0.50	
M3PFHxS	82213.34	3.1615	86,376.00	3.145367	95	50 - 150	0.0161	+/-0.50	
M4PFHpA	407864	3.122333	433,015.00	3.1053	94	50 - 150	0.0170	+/-0.50	
M8PFOA	440273.8	3.405067	474,968.00	3.388983	93	50 - 150	0.0161	+/-0.50	
M8PFOS	75404.03	3.588267	86,508.00	3.580317	87	50 - 150	0.0080	+/-0.50	
M9PFNA	422070.2	3.589317	456,753.00	3.58135	92	50 - 150	0.0080	+/-0.50	
MPFDoA	276867.8	4.0087	357,629.00	4.000733	77	50 - 150	0.0080	+/-0.50	
D5-NEtFOSAA	110697	3.881417	126,371.00	3.87345	88	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	154061	3.809467	146,267.00	3.801517	105	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 (B340691-BLK1)			Lab File ID: B340691-BLK1.d			Analyzed: 05/26/23 04:51			
M8FOSA	243030.8	3.9646	311,594.00	3.956617	78	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	55033.63	2.3982	47,892.00	2.39	115	50 - 150	0.0082	+/-0.50	
M2PFTA	323288.7	4.232633	411,066.00	4.232666	79	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	52543.66	3.731083	60,386.00	3.7311	87	50 - 150	0.0000	+/-0.50	
MPFBA	237821.8	1.025233	272,511.00	1.016917	87	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	91139.92	2.7411	125,214.00	2.741117	73	50 - 150	0.0000	+/-0.50	
M6PFDA	417825.2	3.7316	508,266.00	3.731633	82	50 - 150	0.0000	+/-0.50	
M3PFBS	126992	1.8038	135,285.00	1.8038	94	50 - 150	0.0000	+/-0.50	
M7PFUnA	364439.2	3.865767	436,530.00	3.865783	83	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	28777.83	3.38025	28,303.00	3.380267	102	50 - 150	0.0000	+/-0.50	
M5PFPeA	245578.8	1.640383	268,992.00	1.6321	91	50 - 150	0.0083	+/-0.50	
M5PFHxA	413734.9	2.482	453,352.00	2.4738	91	50 - 150	0.0082	+/-0.50	
M3PFHxS	73950.95	3.14535	86,376.00	3.145367	86	50 - 150	0.0000	+/-0.50	
M4PFHpA	409268.7	3.113417	433,015.00	3.1053	95	50 - 150	0.0081	+/-0.50	
M8PFOA	439141.5	3.397017	474,968.00	3.388983	92	50 - 150	0.0080	+/-0.50	
M8PFOS	71037.66	3.580283	86,508.00	3.580317	82	50 - 150	0.0000	+/-0.50	
M9PFNA	429624.3	3.581333	456,753.00	3.58135	94	50 - 150	0.0000	+/-0.50	
MPFDoA	292138.4	4.000733	357,629.00	4.000733	82	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	109490.3	3.87345	126,371.00	3.87345	87	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	148033.9	3.8015	146,267.00	3.801517	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
LCS (B340691-BS1)		Lab File ID: B340691-BS1.d				Analyzed: 05/26/23 04:44			
M8FOSA	262358.3	3.9566	311,594.00	3.956617	84	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	58365.75	2.39	47,892.00	2.39	122	50 - 150	0.0000	+/-0.50	
M2PFTA	323381.5	4.232633	411,066.00	4.232666	79	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	66196.37	3.723117	60,386.00	3.7311	110	50 - 150	-0.0080	+/-0.50	
MPFBA	253458.7	1.025233	272,511.00	1.016917	93	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	105923.9	2.7411	125,214.00	2.741117	85	50 - 150	0.0000	+/-0.50	
M6PFDA	425997.5	3.7316	508,266.00	3.731633	84	50 - 150	0.0000	+/-0.50	
M3PFBS	135665.4	1.8038	135,285.00	1.8038	100	50 - 150	0.0000	+/-0.50	
M7PFUnA	373020.2	3.865767	436,530.00	3.865783	85	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	31564.74	3.380233	28,303.00	3.380267	112	50 - 150	0.0000	+/-0.50	
M5PFPeA	260309.1	1.640383	268,992.00	1.6321	97	50 - 150	0.0083	+/-0.50	
M5PFHxA	442808.4	2.473783	453,352.00	2.4738	98	50 - 150	0.0000	+/-0.50	
M3PFHxS	77869.27	3.14535	86,376.00	3.145367	90	50 - 150	0.0000	+/-0.50	
M4PFHpA	433235.8	3.105283	433,015.00	3.1053	100	50 - 150	0.0000	+/-0.50	
M8PFOA	470381.8	3.388967	474,968.00	3.388983	99	50 - 150	0.0000	+/-0.50	
M8PFOS	73655.8	3.580283	86,508.00	3.580317	85	50 - 150	0.0000	+/-0.50	
M9PFNA	452598.7	3.581317	456,753.00	3.58135	99	50 - 150	0.0000	+/-0.50	
MPFDoA	295768.7	3.992733	357,629.00	4.000733	83	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	110915.3	3.873433	126,371.00	3.87345	88	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	147737.7	3.793533	146,267.00	3.801517	101	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 (B340691-MS1)			Lab File ID: B340691-MS1.d			Analyzed: 05/26/23 04:59			
M8FOSA	295764.6	3.964583	311,594.00	3.956617	95	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	57245.14	2.39	47,892.00	2.39	120	50 - 150	0.0000	+/-0.50	
M2PFTA	336122.4	4.232633	411,066.00	4.232666	82	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	46123.59	3.731083	60,386.00	3.7311	76	50 - 150	0.0000	+/-0.50	
MPFBA	267832.7	1.025233	272,511.00	1.016917	98	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	119533.1	2.7411	125,214.00	2.741117	95	50 - 150	0.0000	+/-0.50	
M6PFDA	472192.6	3.7316	508,266.00	3.731633	93	50 - 150	0.0000	+/-0.50	
M3PFBS	145689.5	1.8038	135,285.00	1.8038	108	50 - 150	0.0000	+/-0.50	
M7PFUnA	422027.8	3.865767	436,530.00	3.865783	97	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	32976.7	3.38025	28,303.00	3.380267	117	50 - 150	0.0000	+/-0.50	
M5PFPeA	281803.5	1.640383	268,992.00	1.6321	105	50 - 150	0.0083	+/-0.50	
M5PFHxA	477473.1	2.473783	453,352.00	2.4738	105	50 - 150	0.0000	+/-0.50	
M3PFHxS	91758.7	3.14535	86,376.00	3.145367	106	50 - 150	0.0000	+/-0.50	
M4PFHpA	472227.2	3.113417	433,015.00	3.1053	109	50 - 150	0.0081	+/-0.50	
M8PFOA	509488.1	3.397017	474,968.00	3.388983	107	50 - 150	0.0080	+/-0.50	
M8PFOS	85411.59	3.580283	86,508.00	3.580317	99	50 - 150	0.0000	+/-0.50	
M9PFNA	471050.7	3.581333	456,753.00	3.58135	103	50 - 150	0.0000	+/-0.50	
MPFDoA	306049.8	4.000717	357,629.00	4.000733	86	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	126157	3.873433	126,371.00	3.87345	100	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	163561.2	3.8015	146,267.00	3.801517	112	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 (B340691-MSD1)			Lab File ID: B340691-MSD1.d			Analyzed: 05/26/23 05:06			
M8FOSA	260042.7	3.9646	311,594.00	3.956617	83	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	47527.75	2.3982	47,892.00	2.39	99	50 - 150	0.0082	+/-0.50	
M2PFTA	310364.7	4.23265	411,066.00	4.232666	76	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	44099.77	3.731083	60,386.00	3.7311	73	50 - 150	0.0000	+/-0.50	
MPFBA	242245	1.025233	272,511.00	1.016917	89	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	104723.1	2.7411	125,214.00	2.741117	84	50 - 150	0.0000	+/-0.50	
M6PFDA	433323	3.7316	508,266.00	3.731633	85	50 - 150	0.0000	+/-0.50	
M3PFBS	132610.8	1.8121	135,285.00	1.8038	98	50 - 150	0.0083	+/-0.50	
M7PFUnA	381576.2	3.865767	436,530.00	3.865783	87	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	29246.04	3.38025	28,303.00	3.380267	103	50 - 150	0.0000	+/-0.50	
M5PFPeA	254704.2	1.640383	268,992.00	1.6321	95	50 - 150	0.0083	+/-0.50	
M5PFHxA	431729.5	2.482	453,352.00	2.4738	95	50 - 150	0.0082	+/-0.50	
M3PFHxS	80261.19	3.14535	86,376.00	3.145367	93	50 - 150	0.0000	+/-0.50	
M4PFHpA	432335.9	3.113417	433,015.00	3.1053	100	50 - 150	0.0081	+/-0.50	
M8PFOA	476109.7	3.397017	474,968.00	3.388983	100	50 - 150	0.0080	+/-0.50	
M8PFOS	80026.13	3.588283	86,508.00	3.580317	93	50 - 150	0.0080	+/-0.50	
M9PFNA	441381.1	3.581333	456,753.00	3.58135	97	50 - 150	0.0000	+/-0.50	
MPFDoA	266235.3	4.000717	357,629.00	4.000733	74	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	109070.9	3.873433	126,371.00	3.87345	86	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	153578.7	3.8015	146,267.00	3.801517	105	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
Perfluorobutanesulfonic acid (PFBS)	NH-P
Perfluoropentanoic acid (PFPeA)	NH-P
Perfluorohexanoic acid (PFHxA)	NH-P
11Cl-PF3OUdS (F53B Major)	NH-P
9Cl-PF3ONS (F53B Minor)	NH-P
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P
Perfluorodecanoic acid (PFDA)	NH-P
Perfluorododecanoic acid (PFDoA)	NH-P
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P
Perfluoroheptanesulfonic acid (PFHpS)	NH-P
N-EtFOSAA (NEtFOSAA)	NH-P
N-MeFOSAA (NMeFOSAA)	NH-P
Perfluorotetradecanoic acid (PFTA)	NH-P
Perfluorotridecanoic acid (PFTrDA)	NH-P
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P
Perfluorodecanesulfonic acid (PFDS)	NH-P
Perfluorooctanesulfonamide (FOSA)	NH-P
Perfluorononanesulfonic acid (PFNS)	NH-P
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P
Perfluoro-1-butanedisulfonamide (FBSA)	NH-P
Perfluorohexanesulfonic acid (PFHxS)	NH-P
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P
Perfluoropentanesulfonic acid (PFPeS)	NH-P
Perfluoroundecanoic acid (PFUnA)	NH-P
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P
Perfluoroheptanoic acid (PFHpA)	NH-P
Perfluorooctanoic acid (PFOA)	NH-P
Perfluorooctanesulfonic acid (PFOS)	NH-P
Perfluorononanoic acid (PFNA)	NH-P

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



Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com

Barnstable County
3195 Main St. PO Box 427

Barnstable, MA
6206

Project Manager:
Roger Thibault

Con-Test Quote Name/Number:
Pricilla Ellis - petlis@barnstablecounty.org

Invoice Recipient:
Laura Bouley

Sampled By:

http://www.contestlabs.com

39 Spruce Street
East Longmeadow, MA 01028

Doc # 381 Rev 2_06262019

ANALYSIS REQUESTED

Requested Turnaround Time: ☐ 7-Day ☐ 10-Day ☐ Due Date: ☐
PFAS 15-Day (std) ☒ Rush Approval Requested ☐
1-Day ☐ 3-Day ☐ 2-Day ☐ 4-Day ☐
Data Delivery: ☒ EXCEL ☐
Format: PDF ☒ SOXHLET ☐
Other: ☐
CLP Like Data Pkg Required: ☐
Email To: ☐
Fax To #: ☐

Discontinued Analysis
Field Filtered ☐
Lab to Filter ☐
Orthophosphate Samples
Field Filtered ☐
Lab to Filter ☐
PCB ONLY
NON SOXHLET ☐

Preservation Code
Total Number of Containers Only
VIALS
GLASS
PLASTIC
BACTERIA
ENCORE
Glassware in the fridge? Y / N
Glassware in freezer? Y / N
Prepackaged Cooler? Y / N
*Context is not responsible for missing samples from prepacked coolers

Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)
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-

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
1	INF (PRW-4)	5.11.23	13:10	GRAB	GW	H			2		
2	System #1 Mid	5.11.23	13:20	GRAB	GW	M-L			2		
3	System #1 Eff	5.11.23	13:15	GRAB	GW	L			2		
4	System #2 Mid	5.11.23	13:45	GRAB	GW	M-L			2		
5	System #2 Eff	5.11.23	13:30	GRAB	GW	L			2		
6	INF (PRW-4) MS/MSD*	5.11.23	13:10	GRAB	GW	H			2		

Client Comments: *Lab requested MS/MSD. Sample confirmation and report to Rthibault@BETA-Inc.com & Lboulley@BETA-Inc.com

Relinquished by: (signature) *Roger Thibault* Date/Time: 5/11/23 1600
Received by: (signature) *BETA Endge* Date/Time: 5/11/23 1600
Relinquished by: (signature) *Roger Thibault* Date/Time: 5/15/23 9:30
Received by: (signature) *Roger Thibault* Date/Time: 5/15/23 1630
Relinquished by: (signature) *Roger Thibault* Date/Time: 5/15/23 1600
Received by: (signature) *Roger Thibault* Date/Time: 5/15/23 1600

Special Requirements
MA MCP Required ☒
MCP Certification Form Required ☐
CT MCP Required ☐
RCP Certification Form Required ☐
MA State DW Required ☐
PWSID # ☐
Project Entity: Government ☐ Municipality ☐ 21 J ☐ Brownfield ☐
City ☐
Other ☐
WRTA ☐
MWRA ☐
School ☐
MBTA ☐
Chromatogram ☐
AIHA-LAP, LLC ☐

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
RELAC and AIHA-LAP, LLC Accredited

Lab Comments:
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.

Log In Back-Sheet

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



Client Barnstable County

Project BETA

MCP/RCP Required 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 5/15/23 1630

Back-Sheet By / Date / Time DWN 5/15/23 1810

Temperature Method GUN # 5

Temp ☒ $< 6^{\circ}\text{C}$ Actual Temperature 2.2

Rush Samples: Yes ☒ No ☐ Notify _____

Short Hold: Yes ☒ No ☐ Notify _____

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 ☐ ☐

Notes regarding Samples/COC outside of SOP:

Additional Container Notes

June 29, 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: 23F1938

Enclosed are results of analyses for samples as received by the laboratory on June 14, 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: 6/29/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23F1938

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
System #1 Influent	23F1938-01	Ground Water		SOP-454 PFAS	
System #1 Mid Point	23F1938-02	Ground Water		SOP-454 PFAS	
System #1 Effluent	23F1938-03	Ground Water		SOP-454 PFAS	
System #2 Mid Point	23F1938-04	Ground Water		SOP-454 PFAS	
System #2 Effluent	23F1938-05	Ground Water		SOP-454 PFAS	
HW-S(S)	23F1938-06	Ground Water		SOP-454 PFAS	
HW-S(M)	23F1938-07	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:****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)**

23F1938-06RE1[HW-S(S)], 23F1938-07RE1[HW-S(M)]

Perfluorooctanesulfonic acid (PFOS)

23F1938-01RE1[System #1 Influent], 23F1938-06RE1[HW-S(S)], 23F1938-07RE1[HW-S(M)]

S-29

Extracted Internal Standard is outside of control limits.

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

23F1938-01[System #1 Influent]

M2-8:2FTS

23F1938-07[HW-S(M)], S089414-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: 23F1938

Date Received: 6/14/2023

Field Sample #: System #1 Influent

Sampled: 6/9/2023 09:00

Sample ID: 23F1938-01

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)	8.6	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluoropentanoic acid (PFPeA)	22	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorohexanoic acid (PFHxA)	21	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorodecanoic acid (PFDA)	5.3	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluoroheptanesulfonic acid (PFHpS)	8.5	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorodecanesulfonic acid (PFDS)	3.2	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorooctanesulfonamide (FOSA)	59	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorononanesulfonic acid (PFNS)	7.4	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	86	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluoro-1-butanefulfonamide (FBFA)	14	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorohexanesulfonic acid (PFHxS)	31	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	5.9	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluoropentanesulfonic acid (PFPeS)	2.4	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluoroundecanoic acid (PFUnA)	7.6	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluoroheptanoic acid (PFHpA)	13	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorooctanoic acid (PFOA)	14	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW
Perfluorooctanesulfonic acid (PFOS)	700	18	ng/L	10	PF-19	SOP-454 PFAS	6/19/23	6/20/23 16:30	QNW
Perfluorononanoic acid (PFNA)	47	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:17	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23F1938

Date Received: 6/14/2023

Field Sample #: System #1 Mid Point

Sampled: 6/9/2023 09:10

Sample ID: 23F1938-02

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)	8.5	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluoropentanoic acid (PFPeA)	8.2	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorohexanoic acid (PFHxA)	6.0	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorohexanesulfonic acid (PFHxS)	2.9	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	3.5	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluoroheptanoic acid (PFHpA)	2.0	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorooctanesulfonic acid (PFOS)	5.3	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:24	QNW

Project Location: Barnstable, MA

Sample Description:

Work Order: 23F1938

Date Received: 6/14/2023

Field Sample #: System #1 Effluent

Sampled: 6/9/2023 09:20

Sample ID: 23F1938-03

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	6/26/23	6/27/23 16:16	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/26/23	6/27/23 16:16	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23F1938

Date Received: 6/14/2023

Field Sample #: System #2 Mid Point

Sampled: 6/9/2023 09:30

Sample ID: 23F1938-04

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)	2.0	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:39	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23F1938

Date Received: 6/14/2023

Field Sample #: System #2 Effluent

Sampled: 6/9/2023 09:50

Sample ID: 23F1938-05

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	6/19/23	6/20/23 13:46	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluoropentanoic acid (PFPeA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorohexanoic acid (PFHxA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorohexanesulfonic acid (PFHxS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluoroheptanoic acid (PFHpA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorooctanoic acid (PFOA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorooctanesulfonic acid (PFOS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 13:46	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23F1938

Date Received: 6/14/2023

Field Sample #: HW-S(S)

Sampled: 6/9/2023 10:00

Sample ID: 23F1938-06

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)	42	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorobutanesulfonic acid (PFBS)	2.5	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluoropentanoic acid (PFPeA)	150	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorohexanoic acid (PFHxA)	90	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluoroheptanesulfonic acid (PFHpS)	7.2	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	16	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluoro-1-butanesulfonamide (FBSA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorohexanesulfonic acid (PFHxS)	40	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	1400	19	ng/L	10	PF-19	SOP-454 PFAS	6/19/23	6/20/23 16:37	QNW
Perfluoropentanesulfonic acid (PFPeS)	3.4	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluoroheptanoic acid (PFHpA)	61	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorooctanoic acid (PFOA)	67	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW
Perfluorooctanesulfonic acid (PFOS)	300	19	ng/L	10	PF-19	SOP-454 PFAS	6/19/23	6/20/23 16:37	QNW
Perfluorononanoic acid (PFNA)	60	1.9	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:08	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23F1938

Date Received: 6/14/2023

Field Sample #: HW-S(M)

Sampled: 6/9/2023 12:30

Sample ID: 23F1938-07

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)	13	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluoropentanoic acid (PFPeA)	41	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorohexanoic acid (PFHxA)	27	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	4.2	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluoroheptanesulfonic acid (PFHpS)	3.4	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	7.7	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorohexanesulfonic acid (PFHxS)	25	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	250	18	ng/L	10	PF-19	SOP-454 PFAS	6/19/23	6/20/23 16:44	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluoroheptanoic acid (PFHpA)	31	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorooctanoic acid (PFOA)	35	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW
Perfluorooctanesulfonic acid (PFOS)	310	18	ng/L	10	PF-19	SOP-454 PFAS	6/19/23	6/20/23 16:44	QNW
Perfluorononanoic acid (PFNA)	30	1.8	ng/L	1		SOP-454 PFAS	6/19/23	6/20/23 14:15	QNW

Sample Extraction Data**Prep Method:**SOP 454-PFAAS **Analytical Method:**SOP-454 PFAS

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23F1938-01 [System #1 Influent]	B343428	278	1.00	06/19/23
23F1938-01RE1 [System #1 Influent]	B343428	278	1.00	06/19/23
23F1938-02 [System #1 Mid Point]	B343428	258	1.00	06/19/23
23F1938-04 [System #2 Mid Point]	B343428	275	1.00	06/19/23
23F1938-05 [System #2 Effluent]	B343428	284	1.00	06/19/23
23F1938-06 [HW-S(S)]	B343428	268	1.00	06/19/23
23F1938-06RE1 [HW-S(S)]	B343428	268	1.00	06/19/23
23F1938-07 [HW-S(M)]	B343428	279	1.00	06/19/23
23F1938-07RE1 [HW-S(M)]	B343428	279	1.00	06/19/23

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23F1938-03RE1 [System #1 Effluent]	B343978	285	1.00	06/26/23

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

Batch B343428 - SOP 454-PFAAS
Blank (B343428-BLK1)

Prepared: 06/19/23 Analyzed: 06/20/23

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 (B343428-BS1)

Prepared: 06/19/23 Analyzed: 06/20/23

Perfluorobutanoic acid (PFBA)	8.61	1.9	ng/L	9.49	90.7	73-129
Perfluorobutanesulfonic acid (PFBS)	7.68	1.9	ng/L	8.40	91.4	72-130
Perfluoropentanoic acid (PFPeA)	8.30	1.9	ng/L	9.49	87.4	72-129
Perfluorohexanoic acid (PFHxA)	8.45	1.9	ng/L	9.49	89.0	72-129
11Cl-PF3OUdS (F53B Major)	8.34	1.9	ng/L	8.94	93.2	55.1-141
9Cl-PF3ONS (F53B Minor)	7.92	1.9	ng/L	8.85	89.5	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.17	1.9	ng/L	8.94	91.4	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	8.36	1.9	ng/L	9.49	88.1	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	8.46	1.9	ng/L	9.11	92.8	67-138
Perfluorodecanoic acid (PFDA)	9.15	1.9	ng/L	9.49	96.4	71-129
Perfluorododecanoic acid (PFDoA)	9.65	1.9	ng/L	9.49	102	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	7.75	1.9	ng/L	8.45	91.8	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

Batch B343428 - SOP 454-PFAAS

LCS (B343428-BS1)

Prepared: 06/19/23 Analyzed: 06/20/23

Perfluoroheptanesulfonic acid (PFHpS)	8.19	1.9	ng/L	9.07		90.4	69-134			
N-EtFOSAA (NEtFOSAA)	9.70	1.9	ng/L	9.49		102	61-135			
N-MeFOSAA (NMeFOSAA)	10.1	1.9	ng/L	9.49		107	65-136			
Perfluorotetradecanoic acid (PFTA)	9.14	1.9	ng/L	9.49		96.3	71-132			
Perfluorotridecanoic acid (PFTTrDA)	9.30	1.9	ng/L	9.49		98.0	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.03	1.9	ng/L	8.88		90.5	63-143			
Perfluorodecanesulfonic acid (PFDS)	6.61	1.9	ng/L	9.16		72.2	53-142			
Perfluorooctanesulfonamide (FOSA)	8.93	1.9	ng/L	9.49		94.1	67-137			
Perfluorononanesulfonic acid (PFNS)	8.31	1.9	ng/L	9.11		91.2	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	8.79	1.9	ng/L	9.49		92.6	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	9.06	1.9	ng/L	9.49		95.4	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	7.45	1.9	ng/L	8.69		85.7	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	9.35	1.9	ng/L	9.49		98.5	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	9.25	1.9	ng/L	9.49		97.5	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	6.61	1.9	ng/L	9.02		73.3	64-140			
Perfluoropentanesulfonic acid (PFPeS)	8.01	1.9	ng/L	8.92		89.7	71-127			
Perfluoroundecanoic acid (PFUnA)	9.10	1.9	ng/L	9.49		95.9	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.1	1.9	ng/L	9.49		106	58.5-143			
Perfluoroheptanoic acid (PFHpA)	9.06	1.9	ng/L	9.49		95.4	72-130			
Perfluorooctanoic acid (PFOA)	9.02	1.9	ng/L	9.49		95.0	71-133			
Perfluorooctanesulfonic acid (PFOS)	8.02	1.9	ng/L	8.78		91.3	65-140			
Perfluorononanoic acid (PFNA)	8.36	1.9	ng/L	9.49		88.1	69-130			

LCS Dup (B343428-BSD1)

Prepared: 06/19/23 Analyzed: 06/20/23

Perfluorobutanoic acid (PFBA)	9.02	1.9	ng/L	9.40		95.9	73-129	4.60	30	
Perfluorobutanesulfonic acid (PFBS)	8.03	1.9	ng/L	8.32		96.4	72-130	4.44	30	
Perfluoropentanoic acid (PFPeA)	8.51	1.9	ng/L	9.40		90.5	72-129	2.50	30	
Perfluorohexanoic acid (PFHxA)	8.96	1.9	ng/L	9.40		95.2	72-129	5.78	30	
11Cl-PF3OUdS (F53B Major)	8.44	1.9	ng/L	8.86		95.3	55.1-141	1.26	30	
9Cl-PF3ONS (F53B Minor)	8.19	1.9	ng/L	8.77		93.5	59.6-146	3.37	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.08	1.9	ng/L	8.86		102	60.3-131	10.5	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.94	1.9	ng/L	9.40		84.5	37.6-167	5.15	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	8.18	1.9	ng/L	9.03		90.6	67-138	3.38	30	
Perfluorodecanoic acid (PFDA)	9.47	1.9	ng/L	9.40		101	71-129	3.39	30	
Perfluorododecanoic acid (PFDoA)	9.69	1.9	ng/L	9.40		103	72-134	0.445	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	8.15	1.9	ng/L	8.37		97.4	49.4-154	5.02	30	
Perfluoroheptanesulfonic acid (PFHpS)	9.51	1.9	ng/L	8.98		106	69-134	14.8	30	
N-EtFOSAA (NEtFOSAA)	8.99	1.9	ng/L	9.40		95.6	61-135	7.61	30	
N-MeFOSAA (NMeFOSAA)	11.1	1.9	ng/L	9.40		118	65-136	8.68	30	
Perfluorotetradecanoic acid (PFTA)	9.21	1.9	ng/L	9.40		98.0	71-132	0.766	30	
Perfluorotridecanoic acid (PFTTrDA)	9.68	1.9	ng/L	9.40		103	65-144	4.03	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.25	1.9	ng/L	8.79		93.8	63-143	2.63	30	
Perfluorodecanesulfonic acid (PFDS)	6.97	1.9	ng/L	9.08		76.8	53-142	5.28	30	
Perfluorooctanesulfonamide (FOSA)	9.33	1.9	ng/L	9.40		99.3	67-137	4.41	30	
Perfluorononanesulfonic acid (PFNS)	8.27	1.9	ng/L	9.03		91.5	69-127	0.524	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	9.05	1.9	ng/L	9.40		96.3	61.7-156	2.90	30	
Perfluoro-1-butanefulfonamide (FBSA)	9.24	1.9	ng/L	9.40		98.2	61.3-145	1.96	30	
Perfluorohexanesulfonic acid (PFHxS)	8.33	1.9	ng/L	8.61		96.8	68-131	11.2	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	9.84	1.9	ng/L	9.40		105	59.8-147	5.01	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	9.47	1.9	ng/L	9.40		101	59.5-146	2.31	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

Batch B343428 - SOP 454-PFAAS
LCS Dup (B343428-BS1)

Prepared: 06/19/23 Analyzed: 06/20/23

6:2 Fluorotelomersulfonic acid (6:2FTS A)	8.86	1.9	ng/L	8.93		99.2	64-140	29.1	30	
Perfluoropentanesulfonic acid (PFPeS)	8.57	1.9	ng/L	8.84		97.0	71-127	6.83	30	
Perfluoroundecanoic acid (PFUnA)	8.90	1.9	ng/L	9.40		94.6	69-133	2.31	30	
Nonafluoro-3,6-dioxahexanoic acid (NFDHA)	10.7	1.9	ng/L	9.40		113	58.5-143	5.74	30	
Perfluoroheptanoic acid (PFHpA)	9.62	1.9	ng/L	9.40		102	72-130	5.96	30	
Perfluorooctanoic acid (PFOA)	8.91	1.9	ng/L	9.40		94.8	71-133	1.18	30	
Perfluorooctanesulfonic acid (PFOS)	8.21	1.9	ng/L	8.70		94.4	65-140	2.33	30	
Perfluorononanoic acid (PFNA)	9.04	1.9	ng/L	9.40		96.1	69-130	7.84	30	

Batch B343978 - SOP 454-PFAAS
Blank (B343978-BLK1)

Prepared: 06/26/23 Analyzed: 06/27/23

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-Dioxo-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 (PFTTrDA)	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-butanedisulfonamide (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-dioxahexanoic 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							

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 B343978 - SOP 454-PFAAS
LCS (B343978-BS1)

Prepared: 06/26/23 Analyzed: 06/27/23

Perfluorobutanoic acid (PFBA)	9.74	1.9	ng/L	9.37		104	73-129			
Perfluorobutanesulfonic acid (PFBS)	8.41	1.9	ng/L	8.29		101	72-130			
Perfluoropentanoic acid (PFPeA)	9.60	1.9	ng/L	9.37		102	72-129			
Perfluorohexanoic acid (PFHxA)	9.56	1.9	ng/L	9.37		102	72-129			
11Cl-PF3OUdS (F53B Major)	9.58	1.9	ng/L	8.83		109	55.1-141			
9Cl-PF3ONS (F53B Minor)	8.88	1.9	ng/L	8.73		102	59.6-146			
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.35	1.9	ng/L	8.83		106	60.3-131			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.03	1.9	ng/L	9.37		96.4	37.6-167			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.62	1.9	ng/L	9.00		107	67-138			
Perfluorodecanoic acid (PFDA)	10.2	1.9	ng/L	9.37		108	71-129			
Perfluorododecanoic acid (PFDoA)	10.4	1.9	ng/L	9.37		111	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	8.22	1.9	ng/L	8.34		98.6	49.4-154			
Perfluoroheptanesulfonic acid (PFHpS)	10.5	1.9	ng/L	8.95		117	69-134			
N-EtFOSAA (NEtFOSAA)	11.1	1.9	ng/L	9.37		118	61-135			
N-MeFOSAA (NMeFOSAA)	10.8	1.9	ng/L	9.37		115	65-136			
Perfluorotetradecanoic acid (PFTA)	10.7	1.9	ng/L	9.37		114	71-132			
Perfluorotridecanoic acid (PFTrDA)	11.2	1.9	ng/L	9.37		119	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.89	1.9	ng/L	8.76		113	63-143			
Perfluorodecanesulfonic acid (PFDS)	7.44	1.9	ng/L	9.04		82.3	53-142			
Perfluorooctanesulfonamide (FOSA)	10.8	1.9	ng/L	9.37		116	67-137			
Perfluorononanesulfonic acid (PFNS)	9.42	1.9	ng/L	9.00		105	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	8.82	1.9	ng/L	9.37		94.1	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	9.36	1.9	ng/L	9.37		99.9	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	9.16	1.9	ng/L	8.57		107	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	10.2	1.9	ng/L	9.37		108	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	10.7	1.9	ng/L	9.37		115	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	8.10	1.9	ng/L	8.90		91.0	64-140			
Perfluoropentanesulfonic acid (PFPeS)	9.76	1.9	ng/L	8.81		111	71-127			
Perfluoroundecanoic acid (PFUnA)	10.0	1.9	ng/L	9.37		107	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.38	1.9	ng/L	9.37		100	58.5-143			
Perfluoroheptanoic acid (PFHpA)	10.4	1.9	ng/L	9.37		111	72-130			
Perfluorooctanoic acid (PFOA)	9.88	1.9	ng/L	9.37		105	71-133			
Perfluorooctanesulfonic acid (PFOS)	10.1	1.9	ng/L	8.67		116	65-140			
Perfluorononanoic acid (PFNA)	9.80	1.9	ng/L	9.37		105	69-130			

LCS Dup (B343978-BSD1)

Prepared: 06/26/23 Analyzed: 06/27/23

Perfluorobutanoic acid (PFBA)	10.1	1.9	ng/L	9.51		106	73-129	3.65	30	
Perfluorobutanesulfonic acid (PFBS)	8.60	1.9	ng/L	8.41		102	72-130	2.19	30	
Perfluoropentanoic acid (PFPeA)	9.95	1.9	ng/L	9.51		105	72-129	3.55	30	
Perfluorohexanoic acid (PFHxA)	9.79	1.9	ng/L	9.51		103	72-129	2.33	30	
11Cl-PF3OUdS (F53B Major)	9.35	1.9	ng/L	8.96		104	55.1-141	2.42	30	
9Cl-PF3ONS (F53B Minor)	9.82	1.9	ng/L	8.86		111	59.6-146	9.97	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.72	1.9	ng/L	8.96		108	60.3-131	3.79	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	10.3	1.9	ng/L	9.51		108	37.6-167	13.1	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.4	1.9	ng/L	9.13		114	67-138	7.89	30	
Perfluorodecanoic acid (PFDA)	10.6	1.9	ng/L	9.51		112	71-129	4.31	30	
Perfluorododecanoic acid (PFDoA)	10.1	1.9	ng/L	9.51		106	72-134	2.62	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	8.55	1.9	ng/L	8.46		101	49.4-154	3.87	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

Batch B343978 - SOP 454-PFAAS
LCS Dup (B343978-BSD1)

Prepared: 06/26/23 Analyzed: 06/27/23

Perfluoroheptanesulfonic acid (PFHpS)	10.2	1.9	ng/L	9.08		113	69-134	2.49	30	
N-EtFOSAA (NEtFOSAA)	11.1	1.9	ng/L	9.51		116	61-135	0.143	30	
N-MeFOSAA (NMeFOSAA)	11.8	1.9	ng/L	9.51		124	65-136	9.01	30	
Perfluorotetradecanoic acid (PFTA)	11.2	1.9	ng/L	9.51		117	71-132	4.17	30	
Perfluorotridecanoic acid (PFTrDA)	11.5	1.9	ng/L	9.51		121	65-144	2.72	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	9.59	1.9	ng/L	8.89		108	63-143	3.05	30	
Perfluorodecanesulfonic acid (PFDS)	8.18	1.9	ng/L	9.17		89.2	53-142	9.53	30	
Perfluorooctanesulfonamide (FOSA)	10.8	1.9	ng/L	9.51		114	67-137	0.0525	30	
Perfluorononanesulfonic acid (PFNS)	8.42	1.9	ng/L	9.13		92.3	69-127	11.2	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	9.53	1.9	ng/L	9.51		100	61.7-156	7.69	30	
Perfluoro-1-butanefulfonamide (FBSA)	9.68	1.9	ng/L	9.51		102	61.3-145	3.40	30	
Perfluorohexanesulfonic acid (PFHxS)	9.45	1.9	ng/L	8.70		109	68-131	3.11	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	10.7	1.9	ng/L	9.51		112	59.8-147	5.07	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	11.1	1.9	ng/L	9.51		116	59.5-146	2.96	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	9.47	1.9	ng/L	9.03		105	64-140	15.6	30	
Perfluoropentanesulfonic acid (PFPeS)	9.63	1.9	ng/L	8.94		108	71-127	1.44	30	
Perfluoroundecanoic acid (PFUnA)	10.5	1.9	ng/L	9.51		110	69-133	4.41	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	9.89	1.9	ng/L	9.51		104	58.5-143	5.28	30	
Perfluoroheptanoic acid (PFHpA)	10.9	1.9	ng/L	9.51		114	72-130	4.51	30	
Perfluorooctanoic acid (PFOA)	10.2	1.9	ng/L	9.51		108	71-133	3.60	30	
Perfluorooctanesulfonic acid (PFOS)	10.2	1.9	ng/L	8.79		116	65-140	1.18	30	
Perfluorononanoic acid (PFNA)	10.0	1.9	ng/L	9.51		105	69-130	2.01	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.
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
System #1 Influent (23F1938-01)			Lab File ID: 23F1938-01.d			Analyzed: 06/20/23 13:17			
M8FOSA	159784.3	4.02055	208,292.00	3.996567	77	50 - 150	0.0240	+/-0.50	
M2-4:2FTS	34215.32	2.6531	28,656.00	2.595367	119	50 - 150	0.0577	+/-0.50	
M2PFTA	319147.1	4.3703	504,360.00	4.35405	63	50 - 150	0.0163	+/-0.50	
M2-8:2FTS	56921.75	3.842983	41,503.00	3.818733	137	50 - 150	0.0242	+/-0.50	
MPFBA	155963.7	1.0917	242,855.00	1.075083	64	50 - 150	0.0166	+/-0.50	
M3HFPO-DA	103022.8	2.9622	112,170.00	2.91295	92	50 - 150	0.0493	+/-0.50	
M6PFDA	423680.7	3.843467	460,928.00	3.819267	92	50 - 150	0.0242	+/-0.50	
M3PFBS	102065.3	2.011067	103,382.00	1.969733	99	50 - 150	0.0413	+/-0.50	
M7PFUnA	393616.8	3.994	454,055.00	3.970017	87	50 - 150	0.0240	+/-0.50	
M2-6:2FTS	53688.67	3.501333	29,483.00	3.4694	182	50 - 150	0.0319	+/-0.50	*
M5PFPeA	235401.1	1.816233	257,949.00	1.7826	91	50 - 150	0.0336	+/-0.50	
M5PFHxA	414867.2	2.747233	434,970.00	2.68875	95	50 - 150	0.0585	+/-0.50	
M3PFHxS	69500.63	3.28425	67,838.00	3.242583	102	50 - 150	0.0417	+/-0.50	
M4PFHpA	425793.6	3.251867	459,215.00	3.219533	93	50 - 150	0.0323	+/-0.50	
M8PFOA	479030.2	3.510167	486,565.00	3.477917	98	50 - 150	0.0322	+/-0.50	
M8PFOS	49878.5	3.692083	73,861.00	3.66015	68	50 - 150	0.0319	+/-0.50	
M9PFNA	309845.8	3.693117	442,675.00	3.661183	70	50 - 150	0.0319	+/-0.50	
MPFDoA	294304.3	4.1288	401,436.00	4.112633	73	50 - 150	0.0162	+/-0.50	
D5-NEtFOSAA	79517.89	4.001467	111,851.00	3.977483	71	50 - 150	0.0240	+/-0.50	
D3-NMeFOSAA	90757.97	3.9219	125,558.00	3.897717	72	50 - 150	0.0242	+/-0.50	
System #1 Influent (23F1938-01RE1)			Lab File ID: 23F1938-01RE1.d			Analyzed: 06/20/23 16:30			
M8PFOS	73137.64	3.636183	73,861.00	3.692083	99	50 - 150	-0.0559	+/-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 Point (23F1938-02)		Lab File ID: 23F1938-02.d				Analyzed: 06/20/23 13:24			
M8FOSA	173838.8	4.02855	208,292.00	3.996567	83	50 - 150	0.0320	+/-0.50	
M2-4:2FTS	25414.83	2.68715	28,656.00	2.595367	89	50 - 150	0.0918	+/-0.50	
M2PFTA	308266.7	4.3703	504,360.00	4.35405	61	50 - 150	0.0163	+/-0.50	
M2-8:2FTS	49342.96	3.85095	41,503.00	3.818733	119	50 - 150	0.0322	+/-0.50	
MPFBA	227035.3	1.116633	242,855.00	1.075083	93	50 - 150	0.0416	+/-0.50	
M3HFPO-DA	103858.2	2.986567	112,170.00	2.91295	93	50 - 150	0.0736	+/-0.50	
M6PFDA	435416.3	3.851433	460,928.00	3.819267	94	50 - 150	0.0322	+/-0.50	
M3PFBS	96680.31	2.054933	103,382.00	1.969733	94	50 - 150	0.0852	+/-0.50	
M7PFUnA	366629.8	3.994017	454,055.00	3.970017	81	50 - 150	0.0240	+/-0.50	
M2-6:2FTS	33129.76	3.509633	29,483.00	3.4694	112	50 - 150	0.0402	+/-0.50	
M5PFPeA	249035.1	1.857667	257,949.00	1.7826	97	50 - 150	0.0751	+/-0.50	
M5PFHxA	423992.9	2.779967	434,970.00	2.68875	97	50 - 150	0.0912	+/-0.50	
M3PFHxS	72617.95	3.2923	67,838.00	3.242583	107	50 - 150	0.0497	+/-0.50	
M4PFHpA	421209.4	3.268033	459,215.00	3.219533	92	50 - 150	0.0485	+/-0.50	
M8PFOA	475622.8	3.518167	486,565.00	3.477917	98	50 - 150	0.0402	+/-0.50	
M8PFOS	65514.26	3.6921	73,861.00	3.66015	89	50 - 150	0.0320	+/-0.50	
M9PFNA	427604.1	3.701117	442,675.00	3.661183	97	50 - 150	0.0399	+/-0.50	
MPFDoA	306383.9	4.136833	401,436.00	4.112633	76	50 - 150	0.0242	+/-0.50	
D5-NEtFOSAA	83737.41	4.001483	111,851.00	3.977483	75	50 - 150	0.0240	+/-0.50	
D3-NMeFOSAA	96952.75	3.9299	125,558.00	3.897717	77	50 - 150	0.0322	+/-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 Effluent (23F1938-03RE1)			Lab File ID: 23F1938-03RE1.d			Analyzed: 06/27/23 16:16			
M8FOSA	172473.2	3.972583	184,692.00	3.980583	93	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	26862.81	2.529667	28,725.00	2.5461	94	50 - 150	-0.0164	+/-0.50	
M2PFTA	392706	4.32155	475,121.00	4.329683	83	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	35809.99	3.786867	43,601.00	3.794833	82	50 - 150	-0.0080	+/-0.50	
MPFBA	256449.4	1.050167	237,855.00	1.058467	108	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	96793.18	2.855667	113,844.00	2.872033	85	50 - 150	-0.0164	+/-0.50	
M6PFDA	418256	3.787383	433,493.00	3.79535	96	50 - 150	-0.0080	+/-0.50	
M3PFBS	116053	1.911533	94,783.00	1.928117	122	50 - 150	-0.0166	+/-0.50	
M7PFUnA	399289	3.93805	465,869.00	3.94605	86	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	37754.21	3.429317	30,967.00	3.4453	122	50 - 150	-0.0160	+/-0.50	
M5PFPeA	262242	1.731383	255,163.00	1.749417	103	50 - 150	-0.0180	+/-0.50	
M5PFHxA	475423.6	2.621617	431,214.00	2.638533	110	50 - 150	-0.0169	+/-0.50	
M3PFHxS	71052.3	3.201883	62,457.00	3.218333	114	50 - 150	-0.0164	+/-0.50	
M4PFHpA	485773.6	3.170783	444,956.00	3.18695	109	50 - 150	-0.0162	+/-0.50	
M8PFOA	517077.3	3.437833	476,397.00	3.453817	109	50 - 150	-0.0160	+/-0.50	
M8PFOS	68023.49	3.6282	64,373.00	3.6362	106	50 - 150	-0.0080	+/-0.50	
M9PFNA	485894.5	3.629233	430,665.00	3.637233	113	50 - 150	-0.0080	+/-0.50	
MPFDoA	340155.1	4.08065	399,805.00	4.08865	85	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	86963.7	3.945517	100,493.00	3.953517	87	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	101729.5	3.865617	109,665.00	3.873783	93	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
System #2 Mid Point (23F1938-04)		Lab File ID: 23F1938-04.d				Analyzed: 06/20/23 13:39			
M8FOSA	167534.5	4.02055	208,292.00	3.996567	80	50 - 150	0.0240	+/-0.50	
M2-4:2FTS	25885.71	2.644867	28,656.00	2.595367	90	50 - 150	0.0495	+/-0.50	
M2PFTA	371266.8	4.362184	504,360.00	4.35405	74	50 - 150	0.0081	+/-0.50	
M2-8:2FTS	50407.32	3.835033	41,503.00	3.818733	121	50 - 150	0.0163	+/-0.50	
MPFBA	229805.9	1.108333	242,855.00	1.075083	95	50 - 150	0.0333	+/-0.50	
M3HFPO-DA	112263.6	2.945983	112,170.00	2.91295	100	50 - 150	0.0330	+/-0.50	
M6PFDA	435983.7	3.835517	460,928.00	3.819267	95	50 - 150	0.0162	+/-0.50	
M3PFBS	106033.7	2.019367	103,382.00	1.969733	103	50 - 150	0.0496	+/-0.50	
M7PFUnA	355457.5	3.986017	454,055.00	3.970017	78	50 - 150	0.0160	+/-0.50	
M2-6:2FTS	34099.09	3.49335	29,483.00	3.4694	116	50 - 150	0.0240	+/-0.50	
M5PFPeA	258857.3	1.832817	257,949.00	1.7826	100	50 - 150	0.0502	+/-0.50	
M5PFHxA	458310.3	2.73905	434,970.00	2.68875	105	50 - 150	0.0503	+/-0.50	
M3PFHxS	67637.5	3.276233	67,838.00	3.242583	100	50 - 150	0.0336	+/-0.50	
M4PFHpA	458291.2	3.2438	459,215.00	3.219533	100	50 - 150	0.0243	+/-0.50	
M8PFOA	484559.4	3.501867	486,565.00	3.477917	100	50 - 150	0.0239	+/-0.50	
M8PFOS	64696.3	3.684117	73,861.00	3.66015	88	50 - 150	0.0240	+/-0.50	
M9PFNA	442692.3	3.68515	442,675.00	3.661183	100	50 - 150	0.0240	+/-0.50	
MPFDaA	301670	4.120783	401,436.00	4.112633	75	50 - 150	0.0082	+/-0.50	
D5-NEtFOSAA	79580.85	3.993483	111,851.00	3.977483	71	50 - 150	0.0160	+/-0.50	
D3-NMeFOSAA	93020.46	3.9139	125,558.00	3.897717	74	50 - 150	0.0162	+/-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 Effluent (23F1938-05)		Lab File ID: 23F1938-05.d				Analyzed: 06/20/23 13:46			
M8FOSA	174446.3	4.036533	208,292.00	3.996567	84	50 - 150	0.0400	+/-0.50	
M2-4:2FTS	27162.83	2.695367	28,656.00	2.595367	95	50 - 150	0.1000	+/-0.50	
M2PFTA	385676.3	4.378417	504,360.00	4.35405	76	50 - 150	0.0244	+/-0.50	
M2-8:2FTS	52300.65	3.8589	41,503.00	3.818733	126	50 - 150	0.0402	+/-0.50	
MPFBA	238013.5	1.116633	242,855.00	1.075083	98	50 - 150	0.0416	+/-0.50	
M3HFPO-DA	106751.8	2.994683	112,170.00	2.91295	95	50 - 150	0.0817	+/-0.50	
M6PFDA	444032.5	3.859383	460,928.00	3.819267	96	50 - 150	0.0401	+/-0.50	
M3PFBS	103074.9	2.054933	103,382.00	1.969733	100	50 - 150	0.0852	+/-0.50	
M7PFUnA	378100.2	4.002	454,055.00	3.970017	83	50 - 150	0.0320	+/-0.50	
M2-6:2FTS	37284.27	3.517617	29,483.00	3.4694	126	50 - 150	0.0482	+/-0.50	
M5PFPeA	262260.1	1.857667	257,949.00	1.7826	102	50 - 150	0.0751	+/-0.50	
M5PFHxA	456053	2.779967	434,970.00	2.68875	105	50 - 150	0.0912	+/-0.50	
M3PFHxS	72537.76	3.308383	67,838.00	3.242583	107	50 - 150	0.0658	+/-0.50	
M4PFHpA	470396.3	3.27725	459,215.00	3.219533	102	50 - 150	0.0577	+/-0.50	
M8PFOA	524803.3	3.52615	486,565.00	3.477917	108	50 - 150	0.0482	+/-0.50	
M8PFOS	64571.02	3.700083	73,861.00	3.66015	87	50 - 150	0.0399	+/-0.50	
M9PFNA	456981.8	3.701117	442,675.00	3.661183	103	50 - 150	0.0399	+/-0.50	
MPFDaA	319559.4	4.136833	401,436.00	4.112633	80	50 - 150	0.0242	+/-0.50	
D5-NEtFOSAA	80637.78	4.009467	111,851.00	3.977483	72	50 - 150	0.0320	+/-0.50	
D3-NMeFOSAA	94486.78	3.929883	125,558.00	3.897717	75	50 - 150	0.0322	+/-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
HW-S(S) (23F1938-06) Lab File ID: 23F1938-06.d Analyzed: 06/20/23 14:08									
M8FOSA	196661.1	4.028533	208,292.00	4.028533	94	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	41297.28	2.670717	28,656.00	2.661333	144	50 - 150	0.0094	+/-0.50	
M2PFTA	405883.7	4.3703	504,360.00	4.370317	80	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	61711.4	3.850933	41,503.00	3.850933	149	50 - 150	0.0000	+/-0.50	
MPFBA	208273.4	1.108317	242,855.00	1.0917	86	50 - 150	0.0166	+/-0.50	
M3HFPO-DA	115644.8	2.97845	112,170.00	2.970317	103	50 - 150	0.0081	+/-0.50	
M6PFDA	536146.1	3.851417	460,928.00	3.851417	116	50 - 150	0.0000	+/-0.50	
M3PFBS	126337.6	2.019367	103,382.00	2.019367	122	50 - 150	0.0000	+/-0.50	
M7PFUnA	474679.4	3.994	454,055.00	3.994	105	50 - 150	0.0000	+/-0.50	
M5PFPeA	283853.2	1.8328	257,949.00	1.824517	110	50 - 150	0.0083	+/-0.50	
M5PFHxA	505020.3	2.7636	434,970.00	2.7554	116	50 - 150	0.0082	+/-0.50	
M3PFHxS	85415.85	3.2923	67,838.00	3.2923	126	50 - 150	0.0000	+/-0.50	
M4PFHpA	516171.4	3.268033	459,215.00	3.268033	112	50 - 150	0.0000	+/-0.50	
M8PFOA	517267.9	3.51815	486,565.00	3.51815	106	50 - 150	0.0000	+/-0.50	
M8PFOS	76601.09	3.692083	73,861.00	3.692083	104	50 - 150	0.0000	+/-0.50	
M9PFNA	446822.1	3.7011	442,675.00	3.7011	101	50 - 150	0.0000	+/-0.50	
MPFDaA	365462.5	4.136817	401,436.00	4.136833	91	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	92064.82	4.001467	111,851.00	4.001467	82	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	104524.2	3.929883	125,558.00	3.929883	83	50 - 150	0.0000	+/-0.50	
HW-S(S) (23F1938-06RE1) Lab File ID: 23F1938-06RE1.d Analyzed: 06/20/23 16:37									
M2-6:2FTS	37669.23	3.4373	29,483.00	3.509617	128	50 - 150	-0.0723	+/-0.50	
M8PFOS	67059.05	3.636183	73,861.00	3.692083	91	50 - 150	-0.0559	+/-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
HW-S(M) (23F1938-07) Lab File ID: 23F1938-07.d Analyzed: 06/20/23 14:15									
M8FOSA	186543.1	4.036533	208,292.00	4.028533	90	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	35433.79	2.713167	28,656.00	2.661333	124	50 - 150	0.0518	+/-0.50	
M2PFTA	351067.3	4.378417	504,360.00	4.370317	70	50 - 150	0.0081	+/-0.50	
M2-8:2FTS	64088.19	3.858883	41,503.00	3.850933	154	50 - 150	0.0080	+/-0.50	*
MPFBA	227282.1	1.141567	242,855.00	1.0917	94	50 - 150	0.0499	+/-0.50	
M3HFPO-DA	114426.5	2.994683	112,170.00	2.970317	102	50 - 150	0.0244	+/-0.50	
M6PFDA	522133.5	3.859383	460,928.00	3.851417	113	50 - 150	0.0080	+/-0.50	
M3PFBS	116937.4	2.079733	103,382.00	2.019367	113	50 - 150	0.0604	+/-0.50	
M7PFUnA	494098.9	4.001983	454,055.00	3.994	109	50 - 150	0.0080	+/-0.50	
M5PFPeA	273304.8	1.890817	257,949.00	1.824517	106	50 - 150	0.0663	+/-0.50	
M5PFHxA	481101.1	2.796317	434,970.00	2.7554	111	50 - 150	0.0409	+/-0.50	
M3PFHxS	76421.52	3.308383	67,838.00	3.2923	113	50 - 150	0.0161	+/-0.50	
M4PFHpA	490460.4	3.27725	459,215.00	3.268033	107	50 - 150	0.0092	+/-0.50	
M8PFOA	526416.1	3.52615	486,565.00	3.51815	108	50 - 150	0.0080	+/-0.50	
M8PFOS	66688.73	3.700067	73,861.00	3.692083	90	50 - 150	0.0080	+/-0.50	
M9PFNA	427842.7	3.709283	442,675.00	3.7011	97	50 - 150	0.0082	+/-0.50	
MPFDaA	374150.1	4.136817	401,436.00	4.136833	93	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	92660.05	4.009467	111,851.00	4.001467	83	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	106315.2	3.937883	125,558.00	3.929883	85	50 - 150	0.0080	+/-0.50	
HW-S(M) (23F1938-07RE1) Lab File ID: 23F1938-07RE1.d Analyzed: 06/20/23 16:44									
M2-6:2FTS	27144.77	3.437317	29,483.00	3.509617	92	50 - 150	-0.0723	+/-0.50	
M8PFOS	70527.97	3.6362	73,861.00	3.692083	95	50 - 150	-0.0559	+/-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 (B343428-BLK1)			Lab File ID: B343428-BLK1.d			Analyzed: 06/20/23 12:34			
M8FOSA	195113.7	3.996567	208,292.00	3.996567	94	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	31332.77	2.595367	28,656.00	2.595367	109	50 - 150	0.0000	+/-0.50	
M2PFTA	404270.4	4.35405	504,360.00	4.35405	80	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	41634.02	3.818733	41,503.00	3.818733	100	50 - 150	0.0000	+/-0.50	
MPFBA	245147.7	1.075083	242,855.00	1.075083	101	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	105459.3	2.91295	112,170.00	2.91295	94	50 - 150	0.0000	+/-0.50	
M6PFDA	447939.2	3.81925	460,928.00	3.819267	97	50 - 150	0.0000	+/-0.50	
M3PFBS	110028	1.969733	103,382.00	1.969733	106	50 - 150	0.0000	+/-0.50	
M7PFUnA	406860.3	3.970017	454,055.00	3.970017	90	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	34561.73	3.4694	29,483.00	3.4694	117	50 - 150	0.0000	+/-0.50	
M5PFPeA	267950.3	1.7826	257,949.00	1.7826	104	50 - 150	0.0000	+/-0.50	
M5PFHxA	456744.9	2.68875	434,970.00	2.68875	105	50 - 150	0.0000	+/-0.50	
M3PFHxS	70149.01	3.242583	67,838.00	3.242583	103	50 - 150	0.0000	+/-0.50	
M4PFHpA	466762.1	3.21145	459,215.00	3.219533	102	50 - 150	-0.0081	+/-0.50	
M8PFOA	511598.7	3.477917	486,565.00	3.477917	105	50 - 150	0.0000	+/-0.50	
M8PFOS	68084.43	3.66015	73,861.00	3.66015	92	50 - 150	0.0000	+/-0.50	
M9PFNA	468148.3	3.661183	442,675.00	3.661183	106	50 - 150	0.0000	+/-0.50	
MPFDoA	329578.3	4.112633	401,436.00	4.112633	82	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	100614.9	3.977483	111,851.00	3.977483	90	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	109187.8	3.897717	125,558.00	3.897717	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 (B343428-BS1)			Lab File ID: B343428-BS1.d			Analyzed: 06/20/23 12:19			
M8FOSA	187570.2	3.99655	208,292.00	3.996567	90	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	32081.71	2.603583	28,656.00	2.595367	112	50 - 150	0.0082	+/-0.50	
M2PFTA	434271.3	4.35405	504,360.00	4.35405	86	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	44634.23	3.818733	41,503.00	3.818733	108	50 - 150	0.0000	+/-0.50	
MPFBA	249724.8	1.075083	242,855.00	1.075083	103	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	107859.1	2.921133	112,170.00	2.91295	96	50 - 150	0.0082	+/-0.50	
M6PFDA	438303.2	3.81925	460,928.00	3.819267	95	50 - 150	0.0000	+/-0.50	
M3PFBS	110890.1	1.978033	103,382.00	1.969733	107	50 - 150	0.0083	+/-0.50	
M7PFUnA	416983.1	3.97	454,055.00	3.970017	92	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	37465.57	3.469383	29,483.00	3.4694	127	50 - 150	0.0000	+/-0.50	
M5PFPeA	274238.4	1.791367	257,949.00	1.7826	106	50 - 150	0.0088	+/-0.50	
M5PFHxA	461352.8	2.696967	434,970.00	2.68875	106	50 - 150	0.0082	+/-0.50	
M3PFHxS	71841.6	3.250667	67,838.00	3.242583	106	50 - 150	0.0081	+/-0.50	
M4PFHpA	486099.8	3.219533	459,215.00	3.219533	106	50 - 150	0.0000	+/-0.50	
M8PFOA	510753.6	3.4779	486,565.00	3.477917	105	50 - 150	0.0000	+/-0.50	
M8PFOS	70214.04	3.660133	73,861.00	3.66015	95	50 - 150	0.0000	+/-0.50	
M9PFNA	489898.4	3.661167	442,675.00	3.661183	111	50 - 150	0.0000	+/-0.50	
MPFDoA	329503.4	4.112617	401,436.00	4.112633	82	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	100120.9	3.977483	111,851.00	3.977483	90	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	110631	3.897717	125,558.00	3.897717	88	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 (B343428-BSD1)			Lab File ID: B343428-BSD1.d			Analyzed: 06/20/23 12:26			
M8FOSA	187134.2	3.996583	208,292.00	3.996567	90	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	29986.75	2.595383	28,656.00	2.595367	105	50 - 150	0.0000	+/-0.50	
M2PFTA	409155.7	4.354067	504,360.00	4.35405	81	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	43806.65	3.81875	41,503.00	3.818733	106	50 - 150	0.0000	+/-0.50	
MPFBA	236529.3	1.075083	242,855.00	1.075083	97	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	106479.7	2.91295	112,170.00	2.91295	95	50 - 150	0.0000	+/-0.50	
M6PFDA	435558.5	3.819267	460,928.00	3.819267	94	50 - 150	0.0000	+/-0.50	
M3PFBS	106442.3	1.96975	103,382.00	1.969733	103	50 - 150	0.0000	+/-0.50	
M7PFUnA	395814.9	3.970033	454,055.00	3.970017	87	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	32148.59	3.461417	29,483.00	3.4694	109	50 - 150	-0.0080	+/-0.50	
M5PFPeA	263839	1.7826	257,949.00	1.7826	102	50 - 150	0.0000	+/-0.50	
M5PFHxA	440862.3	2.68875	434,970.00	2.68875	101	50 - 150	0.0000	+/-0.50	
M3PFHxS	67726.05	3.242583	67,838.00	3.242583	100	50 - 150	0.0000	+/-0.50	
M4PFHpA	453074.6	3.21145	459,215.00	3.219533	99	50 - 150	-0.0081	+/-0.50	
M8PFOA	502855.9	3.477917	486,565.00	3.477917	103	50 - 150	0.0000	+/-0.50	
M8PFOS	68441.94	3.66015	73,861.00	3.66015	93	50 - 150	0.0000	+/-0.50	
M9PFNA	461870.5	3.661183	442,675.00	3.661183	104	50 - 150	0.0000	+/-0.50	
MPFDaA	331124.1	4.11265	401,436.00	4.112633	82	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	98228.23	3.9775	111,851.00	3.977483	88	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	107999.2	3.897733	125,558.00	3.897717	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
Blank (B343978-BLK1) Lab File ID: B343978-BLK1.d Analyzed: 06/27/23 16:09									
M8FOSA	169684.1	3.9726	184,692.00	3.980583	92	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	28549.19	2.529667	28,725.00	2.5461	99	50 - 150	-0.0164	+/-0.50	
M2PFTA	425401.3	4.321583	475,121.00	4.329683	90	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	38808.89	3.786883	43,601.00	3.794833	89	50 - 150	-0.0080	+/-0.50	
MPFBA	252937	1.050167	237,855.00	1.058467	106	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	92606.89	2.855667	113,844.00	2.872033	81	50 - 150	-0.0164	+/-0.50	
M6PFDA	435522.4	3.7874	433,493.00	3.79535	100	50 - 150	-0.0080	+/-0.50	
M3PFBS	112572.2	1.911533	94,783.00	1.928117	119	50 - 150	-0.0166	+/-0.50	
M7PFUnA	436206.4	3.938067	465,869.00	3.94605	94	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	33763.75	3.429317	30,967.00	3.4453	109	50 - 150	-0.0160	+/-0.50	
M5PFPeA	257704.2	1.731383	255,163.00	1.749417	101	50 - 150	-0.0180	+/-0.50	
M5PFHxA	462102.1	2.621617	431,214.00	2.638533	107	50 - 150	-0.0169	+/-0.50	
M3PFHxS	69027.35	3.201883	62,457.00	3.218333	111	50 - 150	-0.0164	+/-0.50	
M4PFHpA	481019.3	3.170783	444,956.00	3.18695	108	50 - 150	-0.0162	+/-0.50	
M8PFOA	540857.1	3.43785	476,397.00	3.453817	114	50 - 150	-0.0160	+/-0.50	
M8PFOS	69515.05	3.628217	64,373.00	3.6362	108	50 - 150	-0.0080	+/-0.50	
M9PFNA	457828.1	3.62925	430,665.00	3.637233	106	50 - 150	-0.0080	+/-0.50	
MPFDoA	379623.9	4.080667	399,805.00	4.08865	95	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	91784.44	3.945533	100,493.00	3.953517	91	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	104226.5	3.865633	109,665.00	3.873783	95	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 (B343978-BS1)			Lab File ID: B343978-BS1.d			Analyzed: 06/27/23 15:37			
M8FOSA	187242.9	3.972583	184,692.00	3.980583	101	50 - 150	-0.0080	+/-0.50	
M2-4:2FTS	33274.99	2.537883	28,725.00	2.5461	116	50 - 150	-0.0082	+/-0.50	
M2PFTA	456780.1	4.32155	475,121.00	4.329683	96	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	49868.88	3.786867	43,601.00	3.794833	114	50 - 150	-0.0080	+/-0.50	
MPFBA	288497.1	1.050167	237,855.00	1.058467	121	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	99427.73	2.86385	113,844.00	2.872033	87	50 - 150	-0.0082	+/-0.50	
M6PFDA	481415.3	3.787383	433,493.00	3.79535	111	50 - 150	-0.0080	+/-0.50	
M3PFBS	123219.4	1.919817	94,783.00	1.928117	130	50 - 150	-0.0083	+/-0.50	
M7PFUnA	459457.7	3.93805	465,869.00	3.94605	99	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	42971.67	3.429317	30,967.00	3.4453	139	50 - 150	-0.0160	+/-0.50	
M5PFPeA	290531.7	1.731383	255,163.00	1.749417	114	50 - 150	-0.0180	+/-0.50	
M5PFHxA	523165.4	2.621617	431,214.00	2.638533	121	50 - 150	-0.0169	+/-0.50	
M3PFHxS	73002.33	3.21025	62,457.00	3.218333	117	50 - 150	-0.0081	+/-0.50	
M4PFHpA	526935.4	3.178867	444,956.00	3.18695	118	50 - 150	-0.0081	+/-0.50	
M8PFOA	595813	3.445833	476,397.00	3.453817	125	50 - 150	-0.0080	+/-0.50	
M8PFOS	72455.76	3.6282	64,373.00	3.6362	113	50 - 150	-0.0080	+/-0.50	
M9PFNA	507550.6	3.629233	430,665.00	3.637233	118	50 - 150	-0.0080	+/-0.50	
MPFDoA	386082.1	4.08065	399,805.00	4.08865	97	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	97244.2	3.945517	100,493.00	3.953517	97	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	121433.6	3.865617	109,665.00	3.873783	111	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 Dup (B343978-BSD1)			Lab File ID: B343978-BSD1.d			Analyzed: 06/27/23 15:45			
M8FOSA	187842.6	3.9806	184,692.00	3.980583	102	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	32052.92	2.5461	28,725.00	2.5461	112	50 - 150	0.0000	+/-0.50	
M2PFTA	425223.3	4.3297	475,121.00	4.329683	89	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	47632.38	3.79485	43,601.00	3.794833	109	50 - 150	0.0000	+/-0.50	
MPFBA	277212.1	1.050167	237,855.00	1.058467	117	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	96216.84	2.872033	113,844.00	2.872033	85	50 - 150	0.0000	+/-0.50	
M6PFDA	480962.1	3.795367	433,493.00	3.79535	111	50 - 150	0.0000	+/-0.50	
M3PFBS	119829.7	1.919817	94,783.00	1.928117	126	50 - 150	-0.0083	+/-0.50	
M7PFUnA	434567.3	3.94605	465,869.00	3.94605	93	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	38115.67	3.437317	30,967.00	3.4453	123	50 - 150	-0.0080	+/-0.50	
M5PFPeA	282109.2	1.741117	255,163.00	1.749417	111	50 - 150	-0.0083	+/-0.50	
M5PFHxA	504119	2.629833	431,214.00	2.638533	117	50 - 150	-0.0087	+/-0.50	
M3PFHxS	73427.22	3.218333	62,457.00	3.218333	118	50 - 150	0.0000	+/-0.50	
M4PFHpA	509651.3	3.18695	444,956.00	3.18695	115	50 - 150	0.0000	+/-0.50	
M8PFOA	562212.9	3.453833	476,397.00	3.453817	118	50 - 150	0.0000	+/-0.50	
M8PFOS	71237.81	3.6362	64,373.00	3.6362	111	50 - 150	0.0000	+/-0.50	
M9PFNA	509601.6	3.63725	430,665.00	3.637233	118	50 - 150	0.0000	+/-0.50	
MPFDoA	377758.5	4.080683	399,805.00	4.08865	94	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	97552.16	3.953533	100,493.00	3.953517	97	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	112732.7	3.873783	109,665.00	3.873783	103	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-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



Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com

Company Name: Barnstable County
Address: 3195 Main St. PO Box 427
Phone: BFTA
Barnstable, MA
6206
Project Manager: Roger Thibault

Project Name: BFTA
Project Location: Barnstable, MA
Project Number: 6206
Con-Test Quote Name/Number: Roger Thibault
Invoice Recipient: Priscilla Ellis - pellis@barnstablecounty.org
Sampled By: Laura Bouley

Con-Test Work Order #	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	Matrix Code	Comp/Grab	Conc Code	Vials	GLASS	PLASTIC	BACTERIA	ENCORE
1	System #1 Influent	6-9-23	9:00	GW	GRAB	H					
2	System #1 Midpoint MS/MSD	6-9-23	9:10	GW	GRAB	M-L					
3	System #1 Midpoint	6-9-23	9:10	GW	GRAB	M-L					
4	System #1 Effluent	6-9-23	9:20	GW	GRAB	L					
5	System #2 Midpoint	6-9-23	9:30	GW	GRAB	M-L					
6	System #2 Effluent	6-9-23	9:50	GW	GRAB	L					
7	HW-S(s)	6-9-23	10:00	GW	Grab	M-H					
	HW-S(m)	6-9-23	12:30	GW	Grab	M-H					

Refiniquished by: (signature)
Received by: (signature)
Lincoln Fringe
Refiniquished by: (signature)
Received by: (signature)
Refiniquished by: (signature)
Received by: (signature)
Refiniquished by: (signature)
Received by: (signature)
Refiniquished by: (signature)
Received by: (signature)

Date/Time: 6-9-23 15:00
Date/Time: 6-9-23 15:00
Date/Time: 6/14/23 13:55
Date/Time: 6/14/23 17:10
Date/Time: 6/14/23 17:40
Date/Time: 6/14/23 17:40
Date/Time: 6/14/23 17:40

Lab Comments:

http://www.contestlabs.com

CHAIN OF CUSTODY RECORD
39 Spruce Street
East Longmeadow, MA 01028

Requested Turnaround Time
7-Day ☐ 10-Day ☐
PFAS 15-Day (std) ☒ Due Date:
Rush-Approval Required
1-Day ☐ 3-Day ☐
2-Day ☐ 4-Day ☐
Format: PDF ☒ EXCEL ☒
Other: ☐

CLP Like Data Pkg Required: ☐
Email To: ☐
Fax To #: ☐

PCB ONLY
SOXHLET ☐
NON SOXHLET ☐

Field Filtered	Lab to Filter	Orthophosphate Samples	Field Filtered	Lab to Filter
☐	☐	☐	☐	☐

Client Comments: *Lab requested MS/MSD. Sample confirmation and report to Rthibault@BETA-Inc.com & Lbouley@BETA-Inc.com

Detection Limits Requirements	Special Requirements
MA ☐ GW-1 ☒	MA MCP Required ☐ MCP Certification Form Required ☐ CT RCP Required ☐ RCP Certification Form Required ☐ MA State DW Required ☐

Project Entity
Government ☐ Federal ☐ City ☐
Municipality ☐ 21 J ☐ Brownfield ☐
MWRA ☐ School ☐ MBTA ☐
WRTA ☐

Other ☐
Chromatogram ☐
AIIHA-LAP, LLC ☐

NEIAC and AIIHA-LAP, LLC Accredited

ANALYSIS REQUESTED

Matrix Codes:	Preservation Codes:
GW = Ground Water WW = Waste Water DW = Drinking Water A = Air S = Soil SL = Sludge SOL = Solid O = Other (please define)	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

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.

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.pacelabs.com

ENV-FRM-ELON-0001 V05__Sample Receiving Checklist

Log In Back-Sheet

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



Client Dorchester County
Project BFTK
MCP/RCP Required MA MEP
Deliverable Package Requirement GW-1
Location Barnstable, MA
PWSID# (When Applicable) _____
Arrival Method:
Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐
Received By / Date / Time ER 6-14-23 17:40
Back-Sheet By / Date / Time CT 6-14-23 10:37
Temperature Method Bun # 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:

Sample 2 only has double
the volume for MS/MSD.

	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

[illegible]

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 (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	Adjusted bag filter differential pressure (psi)		Pre-Filter Checkpoint Differential Pressure (psi)				K ¹ Adjusted Tank (psi)	Estimated Accumulated Flow Rate (gpm)	Estimated Accumulated Flow Rate (gpm)	Days System Operating	Initial Effluent (ppm)	Instantaneous Effluent Rate (ppm)	Total Solids (lb)	Net Gallons Treated	Average Effluent Rate (gpm)	Estimated Total Iron Accumulated (lb)	System Operating on Departure	System Sampled	Comments
			Pre	Post	Single P1	Single P2	Single P3	Single P4													
8/15/2020	GWTT	Yes	--	--	23	2	16	18	5.43	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	28	29	5.52	19.4	9.4	10	--	76.00	170893	43322	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 8/16/2020 for carbon changes.
gpm																					
8/16/2020	GWTT	Yes	--	--	--	18	8	18	4.96	17.9	8.9	12	--	64.00	170797	37976	12.3	0.001	Yes	No	Rechecked system after carbon changes. Conducted system checks and changed bag filters. Adjusted VFD to 30Hz.
8/17/2020	GWTT	Yes	--	--	18	5	5	9	7.00	17.5	8.9	13	--	68.00	170894	42577	12.3	0.002	Yes	No	Conducted system checks and changed bag filters twice.
8/18/2020	GWTT	No	--	--	17	5	9	9	7.07	17.5	8.7	15	--	64.00	170890	45776	10.5	0.002	Yes	No	Conducted system checks and changed bag filters. Transfer pump off on arrival due to high level alarm in EC tank.
8/19/2020	GWTT	Yes	--	--	18	7	7	11	7.08	19.5	7.7	15	--	64.00	170890	44282	9.2	0.002	Yes	No	Conducted system checks and changed bag filters.
8/19/2020	GWTT	Yes	--	--	18	7	10	11	7.43	19.5	8.5	16	--	60.00	170330	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	--	--	18	7	9	13	7.87	19.0	8.0	19	--	60.00	170421	46721	11.5	0.003	Yes	No	Conducted system checks and changed bag filters.
Total - August 2020 ¹⁴																					
8/19/2020	GWTT	Yes	--	--	18	7	9	13	8.76	19.4	8.4	4	--	60.00	170691	47594	9.6	0.001	Yes	No	Conducted system checks and changed bag filters.
8/19/2020	GWTT	Yes	--	--	18	10	9	15	6.86	17.9	9.0	8	--	60.00	170894	47862	9.3	0.001	Yes	No	Conducted system checks and changed bag filters. Increased VFD to 28Hz.
8/19/2020	GWTT	Yes	--	--	18	10	9	15	6.86	16.7	8.9	11	--	60.00	170891	20880	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	--	60.00	175239	37284	4.5	0.001	Yes	No	Conducted system checks and changed bag filters. Backwashed primary carbon vessel.
8/19/2020	GWTT	Yes	--	--	17	5	7	9	6.95	15.1	8.9	18	--	60.00	177091	27782	5.8	0.001	Yes	No	Conducted system checks and changed bag filters.
8/19/2020	GWTT	Yes	--	--	18	7	4	7	12.28	19.9	8.9	15	--	60.00	170690	29719	4.8	0.001	Yes	No	Conducted system checks and changed bag filters.
8/19/2020	GWTT	Yes	--	--	17	5	3	5	10.53	9.8	8.9	15	--	60.00	169890	22382	3.8	0.001	Yes	No	Conducted system checks and changed bag filters. System samples collected on September 21, 2020.
8/19/2020	GWTT	Yes	--	--	17	6	2	7	10.28	19.1	8.9	18	--	60.00	167179	10952	2.5	0.001	Yes	No	Conducted system checks and changed bag filters.
Total - September 2020 ⁵																					
9/10/2020	GWTT	Yes	--	--	17	5	9	5	10.63	9.5	8.9	2	--	60.00	169394	8796	3.1	0.0009	Yes	No	Conducted system checks and changed bag filters.
9/10/2020	GWTT	Yes	--	--	18	7	5	10	12.77	9.4	6.8	1	--	60.00	169890	30371	7.0	0.00046	Yes	No	Conducted system checks and changed bag filters.
9/10/2020	GWTT	Yes	--	--	17	9	10	10	10.90	9.5	6.7	17	--	50.00	169977	76237	4.8	0.00114	Yes	No	Conducted system checks and changed bag filters.
9/10/2020	GWTT	Yes	--	--	18	10	10	10	10.90	9.5	6.8	18	--	60.00	169977	26781	4.3	0.0011	Yes	No	Conducted system checks and changed bag filters.
9/10/2020	GWTT	Yes	--	--	18	10	11	11	10.90	9.5	6.8	18	--	60.00	169976	36750	5.2	0.00112	Yes	No	Conducted system checks and changed bag filters.
Total - October 2020 ⁵																					
11/10/2020	GWTT	Yes	--	--	18	12	10	13	10.07	5.2	2.7	2	--	60.00	169390	11275	2.6	0.00098	Yes	No	Conducted system checks and changed bag filters.
11/10/2020	GWTT	Yes	--	--	18	12	8	13	10.80	4.9	2.5	8	--	60.00	169390	8486	1.5	0.00013	Yes	No	Conducted system checks and changed bag filters.
11/10/2020	GWTT	Yes	--	--	18	12	12	16	10.80	6.1	5.1	9	--	50.00	169390	20812	4.7	0.00052	Yes	No	Conducted system checks and changed bag filters.
11/10/2020	GWTT	No	--	--	--	--	--	--	--	--	--	12	--	--	169390	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.																					
11/10/2020	GWTT	Yes	--	--	--	--	--	--	--	--	--	14	--	14.00	169397	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 (38 Hz), changed the bag filter twice.
11/10/2020	GWTT	Yes	--	--	15	18	18	17	10.90	6.0	10.1	14	--	50.00	169896	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 (38 Hz), changed the bag filter twice.
Total - November 2020 ⁵																					
11/10/2020	GWTT	Yes	--	--	15	18	13	17	10.90	10.9	10.9	1	--	60.00	169799	49977	9.4	0.0001	Yes	No	Conducted system checks and changed bag filters. Transfer pump off on arrival due to high level in EC tank.
11/10/2020	GWTT	Yes	--	--	--	--	--	--	--	--	--	1	--	60.00	169799	81884	4.7	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.
11/10/2020	GWTT	Yes	--	--	18	18	18	17	1.86	10.0	10.1	7	--	60.00	169799	115278	10.0	0.00135	Yes	No	Conducted system checks and changed bag filters.
11/10/2020	GWTT	Yes	--	--	17	18	6	9	1.85	10.1	10.1	11	--	50.00	169799	128439	18.8	0.00039	Yes	No	Conducted system checks and changed bag filters. Backwashed the primary carbon vessel. Adjusted VFD from 38 Hz to 32 Hz to maintain maximum contact time through carbon vessels.
11/10/2020	GWTT	Yes	--	--	18	18	9	16	1.90	10.9	10.9	10	--	60.00	169890	128414	18.8	0.00071	Yes	No	Conducted system checks and changed bag filters.
11/10/2020	GWTT	Yes	--	--	18	18	10	18	1.87	10.9	10.9	18	--	60.00	169890	128111	18.9	0.00051	Yes	No	Conducted system checks and changed bag filters. Increased transfer pump speed from 32 Hz to 35 Hz.
11/10/2020	GWTT	Yes	--	--	--	--	--	--	--	--	--	15	--	--	169890	128715	22.8	0.00040	Yes	Yes	Conducted system checks and changed bag filters. Increased transfer pump speed from 32 Hz to 35 Hz.
11/10/2020	GWTT	Yes	--	--	18	12	18	17	2.13	17.4	18.7	16	--	50.00	169890	16710	15.9	0.00027	Yes	No	Conducted system checks and changed bag filters. Increased transfer pump speed from 35 Hz to 38 Hz.
11/10/2020	GWTT	Yes	--	--	18	18	18	9	2.13	17.4	18.7	16	--	50.00	169890	128414	22.8	0.00027	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 38 Hz to 32 Hz.
Total - December 2020 ¹⁴																					
1/1/2021	GWTT	Yes	--	--	18	18	18	18	2.88	47.4	22.7	4	--	60.00	169799	122342	17.8	0.00013	Yes	No	Conducted system checks and changed bag filters. Increased the speed on the transfer pump from 32 to 38 Hz.
1/1/2021	GWTT	Yes	--	--	18	18	12	17	2.79	46.8	22.4	4	--	60.00	169799	122323	22.6	0.00008	Yes	No	Conducted system checks and changed bag filters. Increased the speed on the transfer pump from 32 to 40 Hz.
1/1/2021	GWTT	Yes	--	--	18	18	12	18	2.83	48.1	22.4	8	--	60.00	169890	124227	21.6	0.00124	Yes	No	Conducted system checks and changed bag filters.
1/1/2021	GWTT	Yes	--	--	18	18	18	18	2.88	16.1	17.1	11	--	60.00	169890	87380	10.2	0.00119	Yes	No	Conducted system checks and changed bag filters.
1/1/2021	GWTT	Yes	--	--	18	18	3	8	2.81	16.4	16.4	15	--	47.00	169799	16532	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	--	--	18	18	18	17	2.78	48.0	22.8	18	--	60.00	169797	77425	18.0	0.00031	Yes	No	Conducted system checks, changed bag filters twice, and increased VFD on transfer pump from 40 Hz to 42 Hz.
1/1/2021	GWTT	Yes	--	--	18	18	12	15	2.88	47.4	18.7	15	--	50.00	174880	148833	25.5	0.00480	Yes	No	Conducted system checks, changed bag filters, and reduced the VFD on the transfer pump from 42 Hz to 40 Hz.
1/1/2021	GWTT	Yes	--	--	18	18	15	15	1.82	11.3	11.4	15	--	60.00	169890	88138	10.7	0.00030	Yes	No	Conducted system checks, changed bag filters.
1/1/2021	GWTT	Yes	--	--	12	12	15	18	1.81	11.4	11.4	18	--	60.00	169397	128463	18.0	0.00094	Yes	Yes	Conducted system checks, changed bag filters. System sampled on 1/28/2021.
Total - January 2021 ¹⁴																					
1/1/2021	GWTT	Yes	--	--	15	12	15	18	4.45	26.1	13.2	2	--	60.00	169190	128771	17.9	0.00055	Yes	No	Conducted system checks and changed bag filters. Transfer pump VFD set to 40 Hz.
1/1/2021	GWTT	Yes	--	--	15	17	17	15	5.80	25.1	12.4	5	--	60.00	169190	94789	15.5	0.00118	Yes	No	Conducted system checks and changed bag filters.
1/1/2021	GWTT	Yes	--	--	15	17	18	15	4.45	19.0	8.5	8	--	60.00	169892	64833	15.0	0.00183	Yes	No	Conducted system checks and changed bag filters.
1/1/2021	GWTT	Yes	--	--	14	16	18	18	4.55	19.9	10.0	12	--	60.00	1694875	74833	13.0	0.00239	Yes	No	Conducted system checks and changed bag filters.
1/1/2021	GWTT	Yes	--	--	18	16	16	15	5.79	13.1	6.3	18	--	60.00	169890	102628	10.5	0.00027	Yes	No	Conducted system checks and changed bag filters.
1/1/2021	GWTT	Yes	--	--	18	16	12	16	10.80	11.5	5.7	12	--	60.00	1698915	36111	8.4	0.00032	Yes	No	Conducted system checks and changed bag filters. Backwashed primary c&C vessel. Adjusted VFD from 40 Hz to 32 Hz (38 gpm to 40 gpm). System sampled on 2/23/2021.
1/1/2021	GWTT	Yes	--	--	18	12	15	18	10.80	11.4	11.4	18	--	60.00	169890	128414	22.8	0.00027	Yes	No	Conducted system checks and changed bag filters. Backwashed primary c&C vessel. Adjusted VFD from 40 Hz to 32 Hz (38 gpm to 40 gpm). System sampled on 2/23/2021.
Total - February 2021 ¹⁰																					
2/1/2021	GWTT	Yes	--	--	18	16	16	14	3.98	16.7	10.9	18	--	60.00	169390	49502	24.5	0.00047	Yes	No	Conducted system checks and changed bag filters. Transfer pump VFD set to 40 Hz.
2/1/2021	GWTT	Yes	--	--	12	14	14	14	6.55	26.7	13.5	1	--	47.00	169390	165355	16.8	0.00156	Yes	No	Conducted system checks and changed bag filters. Pumped backwash water through system. Reduced transfer pump VFD from 32 Hz to 30 Hz.
2/1/2021	GWTT	Yes	--	--	18	16	14	14	6.53	27.0	13.5	1	--	47.00	169896	130533	25.9	0.00097	Yes	No	Conducted system checks and changed bag filters.
2/1/2021	GWTT	Yes	--	--	12	14	14	14	6.53	48.4	26.2	12	--	47.00	169890	147442	25.6	0.00047	Yes	No	Conducted system checks and changed bag filters. Gated out iron volume to the contents of the wastewater tanks, EC tank, and filter water. Both carbon vessels were replaced.
2/1/2021	GWTT	Yes	--	--	12	14	14	14	6.53	19.3	10.5	12	--	47.00	1693975	18717	14.3	0.00175	Yes	No	Conducted system checks and changed bag filters.
2/1/2021	GWTT	Yes	--	--	18	12	12	17	6.42	16.4	16.7	18	--	60.00	169890	76384	12.2	0.00022	Yes	No	Conducted system checks and changed bag filters.
2/1/2021	GWTT	Yes	--	--	14	14	12	12	6.40	16.4	16.8	12	--	47.00	1693975	41800	6.7	0.00171	Yes	No	Conducted system checks and changed bag filters.
2/1/2021	GWTT	Yes	--	--	12	14	16	16	6.42	19.9	10.9	16	--	60.00	169890	128717	9.1	0.00195	Yes	No	Conducted system checks and changed bag filters.
2/1/2021	GWTT	Yes	--	--	18	16	16	16	5.89	31.1	16.4	16	--	60.00	169390	157217					

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

Date	Operator	System Operating on Date	Inflow (kg) and Outflow (kg) of Charge (kg)		Problems/Obstructions/ Difference Pressure (kg)		Post-Filter Obstructions/ Difference Pressure (kg)		4" Relief Test (kPa)	Releaser		Post-Filter Obstructions/ Difference Pressure (kg)	Inlet System Operating	Inlet Pressure (kPa)	Inlet Temperature (°C)	Inlet Flow Rate (m³/hr)	Inlet Volume (m³)	Inlet Density (kg/m³)	Inlet Specific Gravity	Inlet Viscosity (cP)	Inlet pH	Inlet Color	Inlet Turbidity (NTU)	Inlet Total Solids (mg/L)	Inlet Total Suspended Solids (mg/L)	Inlet Total Dissolved Solids (mg/L)	Inlet Total Hardness (mg/L)	Inlet Total Alkalinity (mg/L)	Inlet Total Acidity (mg/L)	Inlet Total Ammonia (mg/L)	Inlet Total Nitrate (mg/L)	Inlet Total Nitrite (mg/L)	Inlet Total Phosphate (mg/L)	Inlet Total Silica (mg/L)	Inlet Total Sulfate (mg/L)	Inlet Total Chloride (mg/L)	Inlet Total Fluoride (mg/L)	Inlet Total Iodide (mg/L)	Inlet Total Bromide (mg/L)	Inlet Total Boron (mg/L)	Inlet Total Cadmium (mg/L)	Inlet Total Chromium (mg/L)	Inlet Total Copper (mg/L)	Inlet Total Lead (mg/L)	Inlet Total Manganese (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Silver (mg/L)	Inlet Total Zinc (mg/L)	Inlet Total Barium (mg/L)	Inlet Total Strontium (mg/L)	Inlet Total Calcium (mg/L)	Inlet Total Magnesium (mg/L)	Inlet Total Potassium (mg/L)	Inlet Total Sodium (mg/L)	Inlet Total Lithium (mg/L)	Inlet Total Beryllium (mg/L)	Inlet Total Vanadium (mg/L)	Inlet Total Molybdenum (mg/L)	Inlet Total Cobalt (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Copper (mg/L)	Inlet Total Lead (mg/L)	Inlet Total Manganese (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Silver (mg/L)	Inlet Total Zinc (mg/L)	Inlet Total Barium (mg/L)	Inlet Total Strontium (mg/L)	Inlet Total Calcium (mg/L)	Inlet Total Magnesium (mg/L)	Inlet Total Potassium (mg/L)	Inlet Total Sodium (mg/L)	Inlet Total Lithium (mg/L)	Inlet Total Beryllium (mg/L)	Inlet Total Vanadium (mg/L)	Inlet Total Molybdenum (mg/L)	Inlet Total Cobalt (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Copper (mg/L)	Inlet Total Lead (mg/L)	Inlet Total Manganese (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Silver (mg/L)	Inlet Total Zinc (mg/L)	Inlet Total Barium (mg/L)	Inlet Total Strontium (mg/L)	Inlet Total Calcium (mg/L)	Inlet Total Magnesium (mg/L)	Inlet Total Potassium (mg/L)	Inlet Total Sodium (mg/L)	Inlet Total Lithium (mg/L)	Inlet Total Beryllium (mg/L)	Inlet Total Vanadium (mg/L)	Inlet Total Molybdenum (mg/L)	Inlet Total Cobalt (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Copper (mg/L)	Inlet Total Lead (mg/L)	Inlet Total Manganese (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Silver (mg/L)	Inlet Total Zinc (mg/L)	Inlet Total Barium (mg/L)	Inlet Total Strontium (mg/L)	Inlet Total Calcium (mg/L)	Inlet Total Magnesium (mg/L)	Inlet Total Potassium (mg/L)	Inlet Total Sodium (mg/L)	Inlet Total Lithium (mg/L)	Inlet Total Beryllium (mg/L)	Inlet Total Vanadium (mg/L)	Inlet Total Molybdenum (mg/L)	Inlet Total Cobalt (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Copper (mg/L)	Inlet Total Lead (mg/L)	Inlet Total Manganese (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Silver (mg/L)	Inlet Total Zinc (mg/L)	Inlet Total Barium (mg/L)	Inlet Total Strontium (mg/L)	Inlet Total Calcium (mg/L)	Inlet Total Magnesium (mg/L)	Inlet Total Potassium (mg/L)	Inlet Total Sodium (mg/L)	Inlet Total Lithium (mg/L)	Inlet Total Beryllium (mg/L)	Inlet Total Vanadium (mg/L)	Inlet Total Molybdenum (mg/L)	Inlet Total Cobalt (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Copper (mg/L)	Inlet Total Lead (mg/L)	Inlet Total Manganese (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Silver (mg/L)	Inlet Total Zinc (mg/L)	Inlet Total Barium (mg/L)	Inlet Total Strontium (mg/L)	Inlet Total Calcium (mg/L)	Inlet Total Magnesium (mg/L)	Inlet Total Potassium (mg/L)	Inlet Total Sodium (mg/L)	Inlet Total Lithium (mg/L)	Inlet Total Beryllium (mg/L)	Inlet Total Vanadium (mg/L)	Inlet Total Molybdenum (mg/L)	Inlet Total Cobalt (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Copper (mg/L)	Inlet Total Lead (mg/L)	Inlet Total Manganese (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Silver (mg/L)	Inlet Total Zinc (mg/L)	Inlet Total Barium (mg/L)	Inlet Total Strontium (mg/L)	Inlet Total Calcium (mg/L)	Inlet Total Magnesium (mg/L)	Inlet Total Potassium (mg/L)	Inlet Total Sodium (mg/L)	Inlet Total Lithium (mg/L)	Inlet Total Beryllium (mg/L)	Inlet Total Vanadium (mg/L)	Inlet Total Molybdenum (mg/L)	Inlet Total Cobalt (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Copper (mg/L)	Inlet Total Lead (mg/L)	Inlet Total Manganese (mg/L)	Inlet Total Nickel (mg/L)	Inlet Total Silver (mg/L)	Inlet Total Zinc (mg/L)	Inlet Total Barium (mg/L)	Inlet Total Strontium (mg/L)	Inlet Total Calcium (mg/L)	Inlet Total Magnesium (mg/L)	Inlet Total Potassium (mg/L)	Inlet Total Sodium (mg/L)	Inlet Total Lithium (mg/L)	Inlet

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	Inlet Effluent Flow Rate (GPM)	Inlet Effluent Flow Rate (PPM)	Analyzer		Estimated Total PPM Annual Avg	System Operating as Designed	System Saturated	Comments	
			Pre	Post	Stage 1	Stage 2	Stage 1	Stage 2							Violation (SD)	Not Satisfactory					Average Effluent Flow Rate (GPM)
3/1/2001	CHT	No	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	No	Repair was returned to the Site on 3/1/2001. CHTT and Cauts personnel installed heaters inside the system to defrost/thaw the frozen components for the system.	
3/1/2001	CHT	--	--	--	36	6	26	16	2.02	46.6	20.4	1	--	30.00	1040205	30201	25.2	0.00011	Yes	No	Repaired system after freeze conditions, no damage observed. Conducted system checks and changed bag filters.
3/1/2001	CHT	--	--	--	45	12	26	26	0.40	46.2	20.3	4	--	31.00	1040004	70101	36.2	0.00026	Yes	No	Conducted system checks and changed bag filter twice.
3/1/2001	CHT	Yes	--	--	45	34	26	36	2.76	49.0	22.0	8	--	30.00	1030004	83276	14.4	0.00046	Yes	No	Conducted system checks and changed bag filters. Backwashed primary carbon vessel - suggested that carbon carry over is present. From the primary vessel to the secondary vessel 2
3/1/2001	CHT	Yes	--	--	45	12	14	12	0.20	42.0	20.3	11	--	31.00	1040706	14001	15.5	0.00007	Yes	No	Conducted system checks and changed bag filters.
3/1/2001	CHT	Yes	--	--	45	13	17	20	2.33	49.8	20.8	15	--	30.00	1030078	90574	15.7	0.00005	Yes	No	Conducted system checks and changed bag filters. CHTTSG shut down waiting for a Carbon Changeout, 45" effluent water was directed through CHTTSGS 400's
3/1/2001	CHT	Yes	--	--	44	12	26	17	9.22	38.1	36.3	39	--	30.00	1040009	100003	17.4	0.00027	Yes	Yes	Conducted system checks and changed bag filters. Backwashed secondary carbon vessel. System sampled 5/26/02
3/1/2001	CHT	--	--	--	44	9	14	24	6.43	36.7	35.7	25	--	30.00	1040007	117728	12.6	0.00016	Yes	No	Conducted system checks and changed bag filters. Increased VSD to 42Hz.
Totals February 2001										46.6	20.8	25	30.0		106057	155.5	0.0015				
4/1/2001	CHT	--	--	--	50	13	29	30	1.66	31.4	20.4	4	--	30.00	1020007	87762	15.2	0.00023	Yes	No	Conducted system checks and changed bag filters. Backwashed primary carbon vessel.
5/1/2001	CHT	Yes	--	--	49	7	15	17	5.47	35.9	35.9	7	--	34.00	1040003	73231	17.4	0.00047	Yes	No	Conducted system checks and changed bag filters.
5/1/2001	CHT	Yes	--	--	50	16	26	26	1.47	35.4	20.4	10	--	30.00	1040005	82081	18.7	0.00027	Yes	No	Conducted system checks and changed bag filters. Backwashed secondary carbon vessel.
5/1/2001	CHT	Yes	--	--	50	8	10	14	1.90	31.0	20.2	14	--	30.00	1040703	92239	18.7	0.00006	Yes	No	Conducted system checks and changed bag filters.
6/1/2001	CHT	Yes	--	--	50	10	25	25	9.72	39.0	39.0	14	--	30.00	1040706	90909	17.2	0.00019	Yes	No	Conducted system checks and changed bag filters. Adjust VSD.
6/1/2001	CHT	Yes	--	--	50	10	26	26	4.80	33.1	33.1	21	--	30.00	1040705	99275	23.0	0.00015	Yes	Yes	Conducted system checks and changed bag filters. Backwashed primary carbon vessel. System sampled 5/23/02.
6/1/2001	CHT	Yes	--	--	54	14	26	26	6.37	38.1	39.1	24	--	30.00	1040009	108644	25.2	0.00022	Yes	No	Conducted system checks and changed bag filters. Pump out backwash tank through treatment system.
6/1/2001	CHT	Yes	--	--	51	10	26	30	5.17	25.7	20.7	28	--	30.00	1040005	110426	24.2	0.00010	Yes	No	Conducted system checks and changed bag filters.
Totals March 2002										39.9	33.3	21	30.0		176409	17.6	0.0002				
4/1/2002	CHT	Yes	--	--	51	12	32	34	1.46	39.0	39.0	1	--	30.00	1040007	123422	21.4	0.00008	Yes	No	Conducted system checks and changed bag filters.
4/1/2002	CHT	Yes	--	--	48	26	31	36	6.72	18.2	18.2	4	--	20.00	1170108	80064	18.7	0.00029	Yes	No	Conducted system checks and changed bag filters.
4/1/2002	CHT	Yes	--	--	48	21	22	24	6.18	15.1	15.1	8	--	30.00	1030062	93559	16.2	0.00002	Yes	No	Conducted system checks and changed bag filters. Backwash primary carbon vessel, decrease VSD (45-48Hz)
4/1/2002	CHT	Yes	--	--	39	25	24	24	9.87	12.3	12.3	12	--	30.00	1030060	17088	12.3	0.00004	Yes	No	Conducted system checks and changed bag filters. Pump out backwash from last test into system.
4/1/2002	CHT	Yes	--	--	51	16	26	27	16.37	13.9	13.9	13	--	31.00	1040006	62664	13.0	0.00005	Yes	No	Conducted system checks and changed bag filters.
4/1/2002	CHT	Yes	--	--	39	25	25	26	16.87	8.5	8.5	14	--	30.00	1030068	28955	9.2	0.00003	Yes	No	Conducted system checks and changed bag filters.
4/1/2002	CHT	Yes	--	--	39	25	25	26	16.83	8.2	8.2	22	--	30.00	1030068	4889	7.1	0.00002	Yes	Yes	Conducted system checks and changed bag filters. Delivered SD3 box of new bag filters. System samples taken 8-21-02
4/1/2002	CHT	Yes	--	--	44	10	17	20	3.25	31.7	31.7	25	--	30.00	1040005	10607	5.8	0.00005	Yes	No	Conducted system checks and changed bag filters. Backwash secondary carbon vessel. Backwash emergency due to air storage tank not full, air in the influent pipe blowing in and clogging the bag filters. This caused increased effluent flow rate and/or pressure differential. The readings were taken after the second bag filter change.
4/1/2002	CHT	Yes	--	--	40	8	10	12	2.45	30.0	30.0	10	--	30.00	1040009	61054	10.6	0.00014	Yes	No	Conducted system checks and changed bag filters. Pump out backwash from last test into system.
Totals April 2002										39.8	29.2	30	30.1		104444	13.5	0.0014				
5/1/2002	CHT	Yes	--	--	40	10	12	14	3.17	38.7	38.7	7	--	30.00	1030062	62853	14.5	0.00011	Yes	No	Conducted system checks and changed bag filters.
5/1/2002	CHT	Yes	--	--	45	12	14	17	9.37	38.7	38.7	6	--	30.00	1040006	87678	15.2	0.00005	Yes	No	Conducted system checks and changed bag filters.
5/1/2002	CHT	Yes	--	--	46	16	26	30	2.76	46.0	46.0	9	--	31.00	1030063	72921	16.6	0.00028	Yes	No	Conducted system checks and changed bag filters. Turned off upper heater
5/1/2002	CHT	Yes	--	--	--	--	--	--	--	--	--	12	--	--	1779064	14546	--	--	Yes	No	Heaters not fired, and no change in effluent water system. Undergo pump in to "Test" Pressure and flow could't be taken due to lack of water in holding tank. Bag filters were changed, but pump in not "off" position at departure.
5/1/2002	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Yes	No	System restarted 5/16/2002
5/1/2002	CHT	Yes	--	--	46	16	22	26	3.00	40.4	40.4	17	--	30.00	1030074	18868	4.3	0.00028	Yes	No	Conducted system checks and changed bag filters. Backwash primary carbon vessel, empty discharge from right side (ground into greenudge/backwash tank) 400's
5/1/2002	CHT	Yes	--	--	40	16	34	37	6.00	48.4	48.4	20	--	30.00	1040007	79253	18.4	0.00014	Yes	No	Conducted system checks and changed bag filters. Pumped backwash from last test into system. System sampled 5/26/02.
5/1/2002	CHT	Yes	--	--	40	16	34	34	5.28	37.3	37.3	24	--	30.00	1040006	100017	17.4	0.00010	Yes	No	Conducted system checks and changed bag filters.
5/1/2002	CHT	Yes	--	--	41	18	18	18	5.50	33.0	33.0	28	--	30.00	1040005	90611	15.8	0.00019	Yes	No	Conducted system checks and changed bag filters. Backwash secondary carbon vessel.
Totals May 2002										39.3	39.3	38	30.9		118896	16.3	0.0017				
4/1/2003	CHT	Yes	--	--	42	17	26	28	9.72	35.0	35.0	7	--	30.00	1040007	87482	22.6	0.00028	Yes	No	Conducted system checks and changed bag filters. Delivered SD3 box of new bag filters.
4/1/2003	CHT	Yes	--	--	42	12	26	26	4.87	36.1	36.1	6	--	30.00	1040704	97427	22.6	0.00052	Yes	No	Conducted system checks and changed bag filters. Pumped back from last test into system.
4/1/2003	CHT	Yes	--	--	46	16	26	28	1.08	36.0	36.0	10	--	30.00	1040009	94457	16.4	0.00003	Yes	No	Conducted system checks and changed bag filters.
4/1/2003	CHT	Yes	--	--	49	26	26	38	3.97	36.9	36.9	19	--	30.00	1040009	75278	17.4	0.00007	Yes	No	Conducted system checks and changed bag filters.
4/1/2003	CHT	Yes	--	--	46	16	36	38	1.40	35.1	35.1	17	--	22.00	1040006	65559	11.4	0.00076	Yes	No	Conducted system checks and changed bag filters.
4/1/2003	CHT	Yes	--	--	45	26	38	40	3.37	34.3	34.3	20	--	27.00	1040477	15509	12.8	0.01016	Yes	Yes	Conducted system checks and changed bag filters. Backwash primary carbon vessel. Flush into sludge out of bottom of right side on 02 tank. System sampled 5/27-02
4/1/2003	CHT	Yes	--	--	43	26	36	36	3.88	34.3	34.3	24	--	31.00	1030073	102095	18.2	0.00018	Yes	No	Conducted system checks and changed bag filters. Backwash secondary carbon vessel. Pump down outside backwash tank through treatment system.
4/1/2003	CHT	Yes	--	--	46	16	36	38	1.06	36.2	36.2	27	--	30.00	1040009	71209	16.7	0.00019	Yes	No	Conducted system checks and changed bag filters.
4/1/2003	CHT	Yes	--	--	46	16	17	18	6.35	36.2	36.2	30	--	30.00	1040008	81087	21.3	0.00014	Yes	No	Conducted system checks and changed bag filters.
Totals June 2002										39.8	25.5	30	30.9		76794	17.6	0.0001				
5/1/2003	CHT	No	--	--	--	--	15	14	4.57	36.6	36.6	1	--	31.00	1040005	47957	4.6	0.00023	Yes	No	Conducted system checks and changed bag filters. Backwash primary carbon vessel. Flush into sludge out of bottom of right side on 02 tank. Electronics came to life well pump three duty periods.
5/1/2003	CHT	Yes	--	--	44	12	16	22	4.77	25.7	25.7	7	--	30.00	1040009	86754	20.1	0.00023	Yes	No	Conducted system checks and changed bag filters.
5/1/2003	CHT	Yes	--	--	48	14	39	31	3.12	23.9	23.9	6	--	30.00	1010106	82157	21.3	0.00049	Yes	No	Conducted system checks and changed bag filters. Pump down green tank.
5/1/2003	CHT	Yes	--	--	43	18	24	24	5.31	23.0	23.0	10	--	30.00	1040007	112951	19.6	0.00075	Yes	No	Conducted system checks and changed bag filters.
5/1/2003	CHT	Yes	--	--	43	18	28	32	5.45	21.7	21.7	13	--	30.00	1030044	80257	18.6	0.00003	Yes	No	Conducted system checks and changed bag filters.
5/1/2003	CHT	Yes	--	--	40	18	30	34	1.90	20.4	20.4	17	--	30.00	1040008	80394	12.0	0.00008	Yes	No	Conducted system checks and changed bag filters.
5/1/2003	CHT	Yes	--	--	44	21	18	26	5.00	20.4	20.4	20	--	30.00	1040006	62556	14.6	0.00012	Yes	No	Conducted system checks and changed bag filters.
5/1/2003	CHT	Yes	--	--	42	27	39	29	4.96	17.4	17.4	29	--	30.00	1040008	74004	17.3	0.00013	Yes	No	Conducted system checks and changed bag filters. Backwash secondary carbon vessel. System sampled 7/27-02.
Totals July 2002										39.8	25.5	30	30.1		104630	17.2	0.0019				
6/1/2003	CHT	Yes	--	--	46	17	18	22	9.37	36.6	36.6	7	--	30.00	1040015	109164	15.3	0.00012	Yes	No	Conducted system checks and changed bag filters. Pump down green tank.
6/1/2003	CHT	Yes	--	--	27	25	26	28	9.47	13.7	13.7	5	--	17.00	1040016	17321	13.3	0.00025	Yes	No	Conducted system checks and changed bag filters. Decrease VSD (48Hz to 25Hz)
6/1/2003	CHT	Yes	--	--	55	12	18	18	15.10	13.0	13.0	8	--	30.00	1040006	82025	11.4	0.00003	Yes	No	Conducted system checks and changed bag filters. Flush into sludge.
6/1/2003	CHT	Yes	--	--	55	25	14	17	12.87	9.5	9.5	11	--	30.00	1040006	47361	9.7	0.00041	Yes	No	Conducted system checks and changed bag filters.
6/1/2003	CHT	Yes	--	--	57	14	14	17	14.81	8.4	8.4	15	--	30.00	1040006	12389	9.1	0.00002	Yes	No	Conducted system checks and changed bag filters.
System Shutdown 6/15/2003, New research and truck carbon installed. System restarted 6/24/03																					
6/1/2003	CHT	No	--	--	--	--	15	11	7.12	17.2	17.2	14	--	31.00	1040008	22428	1.6	0.00010	Yes	No	Restart System
6/1/2003	CHT	Yes	--	--	55	19	12	14	5.40	36.3	36.3	20	--	31.00	1040009	74005	12.0	0.00010	Yes	No	Conducted system checks and changed bag filters. Increase discharge flow rate. System Sampled.
Totals August 2002										50.4	50.4	22	22.3		407960	12.9	0.0011				

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)	Estimated Combined Inflow Rate (gpm)		Post System Operating	Instantaneous Effluent Flow Rate (gpm)		Instantaneous Effluent Flow Rate (gpm)	Total Flow (gpm)	Net Culture Treated	Average Effluent Flow Rate (gpm)	Estimated Total Flow Rate (gpm)	System Operating on Supplement	System Sampled	Comments	
			Pre	Post	Range PT	Range PT	Range PT	Range PT		Combined Inflow Rate (gpm)	Estimated Inflow Rate (gpm)		Instantaneous Effluent Flow Rate (gpm)	Instantaneous Effluent Flow Rate (gpm)									
9/30/2023	GWTT	Yes	--	--	43	34	9	13	0.61	13.6	13.6	2	--	38.00	2386176	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	--	--	38	38	15	15	0.07	38.5	38.5	4	--	37.00	2385719	137643	23.9	0.00005	Yes	No	Conducted system checks and changed bag filters.		
9/30/2023	GWTT	Yes	--	--	37	30	16	20	0.07	38.5	38.5	9	--	36.00	2385669	138849	23.3	0.00006	Yes	No	Conducted system checks and changed bag filters.		
9/30/2023	GWTT	Yes	--	--	46	36	16.5	20	0.03	38.4	38.4	12	--	41.00	2385663	138888	13.7	0.00003	Yes	No	Conducted system checks and changed bag filters. Backwash primary carbon vessel.		
9/30/2023	GWTT	Yes	--	--	45	35	16	14	0.06	40.7	40.7	14	--	34.00	2385675	139221	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	0.07	39.9	39.9	18	--	35.00	2385680	140001	21.9	0.00019	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	45.1	45.1	20	--	37.00	2385721	140751	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 drain. Add stock acid to storage.
9/30/2023	GWTT	Yes	--	--	47	33	13	14	2.15	17.0	17.0	23	--	34.00	2385887	140672	10.3	0.00001	Yes	No	Conducted system checks and changed bag filters.		
Total - September 2023																							
9/30/2023	GWTT	Yes	--	--	47	33	15	20	2.13	17.4	17.4	3	--	34.00	2386220	139231	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	2386312	140702	14.7	0.00040	Yes	No	Conducted system checks and changed bag filters.		
9/30/2023	GWTT	Yes	--	--	44	33	15	20	Not Reported	Not Reported	Not Reported	13	--	35.00	2386386	140424	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	18	--	34.00	2386393	140414	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	18	--	35.00	2386393	139461	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	17.0	24	--	35.00	2386498	140366	18.8	0.00131	Yes	No	Conducted system checks and changed bag filters.		
9/30/2023	GWTT	Yes	--	--	43	33	16	19	2.05	16.6	16.6	24	--	35.00	2386580	140322	16.5	0.00132	Yes	No	Conducted system checks and changed bag filters.		
9/30/2023	GWTT	Yes	--	--	43	34	12	17	1.98	16.9	16.9	24	--	35.00	2386600	140403	16.8	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	11.0	24	--	35.00	2386694	139841	16.1	0.00195	Yes	No	Conducted system checks and changed bag filters. High level alarm light not turning on but still shutting off.		
Total - October 2023																							
10/01/2023	GWTT	Yes	--	--	42	34	15	19	2.42	10.7	10.7	4	--	35.00	23874616	139400	13.8	0.00021	Yes	No	Conducted system checks and changed bag filters.		
10/01/2023	GWTT	Yes	--	--	23	35	13	16	2.30	13.3	13.3	24	--	35.00	23875010	140204	9.4	0.00025	Yes	No	Conducted system checks and changed bag filters.		
10/01/2023	GWTT	Yes	--	--	39	35	14	14	2.47	49.7	49.7	24	--	34.00	2388011	140001	10.4	0.00044	Yes	No	Conducted system checks and changed bag filters. Flush iron sludge from site glass.		
10/01/2023	GWTT	Yes	--	--	39	37	16	20	2.40	49.0	49.0	13	--	35.00	23875010	139800	13.4	0.00077	Yes	No	Conducted system checks and changed bag filters. Flushed levels in discharge threaded plug.		
10/01/2023	GWTT	Yes	--	--	38	37	16	19	2.34	48.4	48.4	18	--	35.00	23881575	139801	17.7	0.00123	Yes	No	Conducted system checks and changed bag filters.		
10/01/2023	GWTT	Yes	--	--	39	38	17	21	2.40	49.4	49.4	24	--	35.00	23874889	139844	18.2	0.00147	Yes	No	Conducted system checks and changed bag filters. Flush iron sludge from site glass.		
10/01/2023	GWTT	Yes	--	--	35	35	16	20	2.72	45.1	45.1	24	--	35.00	23884975	140386	16.4	0.00137	Yes	No	Conducted system checks and changed bag filters. Flush iron sludge from site glass.		
10/01/2023	GWTT	Yes	--	--	35	36	16	20	2.76	45.1	45.1	24	--	35.00	23884985	139901	13.6	0.00147	Yes	Yes	Conducted system checks and changed bag filters. System sampled 10.25.22.		
Total - November 2023																							
10/02/2023	GWTT	Yes	--	--	42	37	17	21	2.78	44.0	44.0	2	--	35.00	23888100	140401	10.8	0.00008	Yes	No	Conducted system checks and changed bag filters.		
10/02/2023	GWTT	Yes	--	--	39	36	16	21	2.83	43.8	43.8	1	--	35.00	23887120	139801	11.6	0.00026	Yes	No	Conducted system checks and changed bag filters.		
10/02/2023	GWTT	Yes	--	--	31	29	19	22	4.00	40.4	40.4	4	--	29.00	23884989	139824	13.6	0.00047	Yes	No	Conducted system checks and changed bag filters.		
10/02/2023	GWTT	Yes	--	--	34	38	18	21	4.48	45.4	45.4	12	--	34.00	23888861	140201	10.4	0.00048	Yes	No	Conducted system checks and changed bag filters.		
10/02/2023	GWTT	Yes	--	--	39	30	19	22	3.80	47.2	47.2	14	--	35.00	23888888	139823	15.6	0.00006	Yes	No	Conducted system checks and changed bag filters. Flush site glass.		
10/02/2023	GWTT	Yes	--	--	23	29	16	19	5.52	14.9	14.9	13	--	29.00	23888177	140380	15.6	0.00116	Yes	No	Conducted system checks and changed bag filters.		
10/02/2023	GWTT	Yes	--	--	37	38	19	24	3.79	39.0	39.0	10	--	35.00	23887307	140700	10.9	0.00109	Yes	Yes	Conducted system checks and changed bag filters. System samples collected on 10/23/23.		
10/02/2023	GWTT	Yes	--	--	39	38	19	24	3.70	39.1	39.1	10	--	35.00	23888805	140401	11.0	0.00125	Yes	No	Conducted system checks and changed bag filters.		
10/02/2023	GWTT	Yes	--	--	35	38	19	22	4.00	40.4	40.4	10	--	34.00	23887704	140401	14.8	0.00171	Yes	No	Conducted system checks and changed bag filters. Flush site glass.		
Total - December 2023																							
10/02/2023	GWTT	Yes	--	--	37	38	19	24	3.70	39.0	39.0	10	--	34.00	23887704	140401	14.8	0.00171	Yes	No	Conducted system checks and changed bag filters. Flush site glass.		

1. C-1 Control Engineering, GW1 - Groundwater Treatment Technology
2. Prior to November 2023, the instantaneous inflow rate (IIR) flow rates are calculated based on the cross-sectional volume per vertical inch of the inflow tank and measured flow (IIR) into or sharing (IIR) 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 12.3 gallons per 1-inch. Since 10/1/2023 (Following the replacement of the effluent tanks), IIR flow rates from IIR-4 are calculated based on an approximation. This Combined instantaneous flow rate represents the combined flow within both flow main pipes from recovery well IIR-4 and since the output of GWTS1 on 10/1/23, approximately 50% of the Combined instantaneous Inflow Rate represents the instantaneous Inflow Rate of GWTS1.
3. Prior to November 2023 the total mass of PMS removed is calculated based on the calculated effluent flow rate, the number of days the system has been operating, and the average total inflow PMS concentration for the month. Since November 2023, the total mass of PMS removed is calculated based on the effluent flow rate.
4. N/A or -- Not Reported
5. N/A - 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 effluent flow rate could not include the calculated treatment rate (concentration to level) of the tank in the site glass on the EC tank from accumulated iron scale precipitates in the bottom of the tank. The iron-scale precipitates were removed from the EC tank on Oct. 28, 2023.
8. Following the operation of the new flow main and the installation of GWTS1 on November 1, 2023, instantaneous effluent flow rates are estimated by approximating 50% of the Combined instantaneous Inflow Rate value.
9. The instantaneous effluent flow rate is calculated as the average instantaneous flow rate of the effluent tanks. The average instantaneous flow rate is calculated based on the effluent discharge piping was not visible in flow rate less than 40 GPM.
10. The Average effluent flow rate is calculated from the site glass (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, 2024, calculated average effluent flow rates and the average instantaneous flow rate were calculated based on the reported treatment rate. The reported flow rate readings on the effluent discharge piping were not visible in flow rate 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 "Total" flow rate (from left to right) included the Average instantaneous Inflow Rate, Total Days of Operation, Average instantaneous Effluent Flow Rate, and Estimated PMS removed for the respective monthly reporting period.
14. Running average values shown for the effluent flow rate. Prior to November 1, 2023, totals shown (from left to right) included the Average instantaneous Inflow Rate, Total Days of Operation, Average instantaneous Effluent Flow Rate, and Estimated PMS removed for the respective monthly reporting period.
15. The calculated total Gallons Treated and Average Effluent Flow Rate are based on recorded data and the totals are representative of the monthly flow reporting period. The average effluent flow rate calculation from the first recording date are based on measurements from the last recording date of the previous reporting period.
16. February 16, 2023 GWTS1 was shut down waiting for a Carbon Changeout, all water was routed through GWTS #1. The estimated instantaneous Inflow Rate was not divided between the 2 systems and therefore matches the Combined instantaneous Estimated Inflow 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 ⁷				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	50764							

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) ⁷						
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) ⁴	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		Totalizer (gal)	Instant. Flow Rate (GPM) ⁴	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 ^{6,10}				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 ^{6,10}				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)																							
PFO5	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 Σ6PFAS	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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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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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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17. NE - Not Established

APPENDIX C

LABORATORY REPORTS/CERTIFICATES OF ANALYSIS

Site Groundwater Monitoring

February 17, 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: 23B0760

Enclosed are results of analyses for samples as received by the laboratory on February 6, 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: 2/17/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23B0760

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
PFW-1	23B0760-01	Ground Water		SOP-454 PFAS	
PFW-2	23B0760-02	Ground Water		SOP-454 PFAS	
PFW-5	23B0760-03	Ground Water		SOP-454 PFAS	
OW-8A	23B0760-04	Ground Water		SOP-454 PFAS	
MW-3S	23B0760-05	Ground Water		SOP-454 PFAS	
MW-12S	23B0760-06	Ground Water		SOP-454 PFAS	
MW-22	23B0760-07	Ground Water		SOP-454 PFAS	
PC-1	23B0760-08	Ground Water		SOP-454 PFAS	
PC-6A	23B0760-09	Ground Water		SOP-454 PFAS	
PC-16D	23B0760-10	Ground Water		SOP-454 PFAS	
PC-28	23B0760-11	Ground Water		SOP-454 PFAS	
PC-30	23B0760-12	Ground Water		SOP-454 PFAS	
PC-34S	23B0760-13	Ground Water		SOP-454 PFAS	
PC-39	23B0760-14	Ground Water		SOP-454 PFAS	
Duplicate 1	23B0760-15	Ground Water		SOP-454 PFAS	
Equipment Blank 1	23B0760-16	Ground Water		SOP-454 PFAS	
Equipment Blank 2	23B0760-17	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:****E**

Reported result is estimated. Value reported over verified calibration range.

Analyte & Samples(s) Qualified:**Perfluoro-1-hexanesulfonamide (FHxSA)**

B330940-MS1, B330940-MSD1

Perfluorooctanesulfonic acid (PFOS)

B330940-MS1, B330940-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:**N-EtFOSAA (NEtFOSAA)**

B330940-BS1

N-MeFOSAA (NMeFOSAA)

B330940-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)**

23B0760-01[PFW-1], 23B0760-02[PFW-2], 23B0760-04[OW-8A], 23B0760-05[MW-3S], 23B0760-06[MW-12S], 23B0760-08[PC-1], 23B0760-09[PC-6A], 23B0760-10[PC-16D], 23B0760-11[PC-28], 23B0760-12[PC-30], 23B0760-13[PC-34S], 23B0760-14[PC-39], 23B0760-15[Duplicate 1], B330940-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:**11Cl-PF3OUdS (F53B Major)**

B330940-MS1, B330940-MSD1

8:2 Fluorotelomersulfonic acid (8:2FTS A)

23B0760-01[PFW-1], B330940-MS1, B330940-MSD1

9Cl-PF3ONS (F53B Minor)

B330940-MS1, B330940-MSD1

Perfluoroheptanesulfonic acid (PFHpS)

23B0760-01[PFW-1], B330940-MS1, B330940-MSD1

Perfluorononanesulfonic acid (PFNS)

23B0760-01[PFW-1], B330940-MS1, B330940-MSD1

Perfluorotetradecanoic acid (PFTA)

B330940-MS1, B330940-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:**Perfluorohexanesulfonic acid (PFHxS)**

23B0760-01[PFW-1], B330940-MS1, B330940-MSD1

Perfluorooctanesulfonic acid (PFOS)

B330940-MS1, B330940-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:**6:2 Fluorotelomersulfonic acid (6:2FTS A)**

23B0760-01[PFW-1], B330940-MS1

N-EtFOSAA (NEtFOSAA)

B330940-MSD1

N-MeFOSAA (NMeFOSAA)

B330940-MS1

Perfluoro-1-hexanesulfonamide (FHxSA)

B330940-MS1

Perfluorodecanoic acid (PFDA)

23B0760-01[PFW-1], B330940-MS1

Perfluorohexanoic acid (PFHxA)

23B0760-01[PFW-1], B330940-MS1

Perfluorononanoic acid (PFNA)

23B0760-01[PFW-1], B330940-MS1

Perfluoropentanoic acid (PFPeA)

23B0760-01[PFW-1], B330940-MS1

Perfluoropetanesulfonic acid (PFPeS)

23B0760-01[PFW-1], B330940-MS1

PF-19

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

Analyte & Samples(s) Qualified:**Perfluoro-1-hexanesulfonamide (FHxSA)**

23B0760-01RE1[PFW-1]

Perfluorohexanesulfonic acid (PFHxS)

23B0760-04RE1[OW-8A]

Perfluorooctanesulfonic acid (PFOS)

23B0760-01RE1[PFW-1], 23B0760-06RE1[MW-12S], 23B0760-11RE1[PC-28], 23B0760-12RE1[PC-30], 23B0760-13RE1[PC-34S], 23B0760-15RE1[Duplicate 1]

PF-20

Quantifying ion signal to noise ratio is <10. Detection is suspect.

Analyte & Samples(s) Qualified:**Perfluorobutanoic acid (PFBA)**

23B0760-04[OW-8A], 23B0760-05[MW-3S]

Perfluorononanoic acid (PFNA)

23B0760-03[PFW-5]

Perfluoropentanoic acid (PFPeA)

23B0760-05[MW-3S]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**M2-4:2FTS**

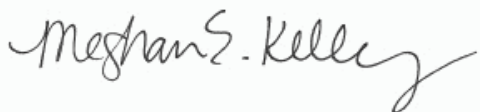
23B0760-09[PC-6A]

MPFBA

23B0760-04[OW-8A]

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: 23B0760

Date Received: 2/6/2023

Field Sample #: PFW-1

Sampled: 1/31/2023 09:00

Sample ID: 23B0760-01

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)	170	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorobutanesulfonic acid (PFBS)	63	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluoropentanoic acid (PFPeA)	610	20	ng/L	1	MS-22	SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorohexanoic acid (PFHxA)	610	20	ng/L	1	MS-22	SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
11Cl-PF3OUdS (F53B Major)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
9Cl-PF3ONS (F53B Minor)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	1300	20	ng/L	1	MS-12	SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorodecanoic acid (PFDA)	78	20	ng/L	1	MS-22	SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorododecanoic acid (PFDoA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluoroheptanesulfonic acid (PFHpS)	150	20	ng/L	1	MS-12	SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
N-EtFOSAA (NEtFOSAA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
N-MeFOSAA (NMeFOSAA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorotetradecanoic acid (PFTA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorodecanesulfonic acid (PFDS)	20	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorooctanesulfonamide (FOSA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorononanesulfonic acid (PFNS)	85	20	ng/L	1	MS-12	SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	2600	200	ng/L	10	PF-19	SOP-454 PFAS	2/13/23	2/15/23 16:03	BLM
Perfluoro-1-butanefulfonamide (FBFA)	110	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorohexanesulfonic acid (PFHxS)	1500	20	ng/L	1	MS-19	SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	640	20	ng/L	1	L-05, MS-22	SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluoropentanesulfonic acid (PFPeS)	160	20	ng/L	1	MS-22	SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluoroundecanoic acid (PFUnA)	130	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluoroheptanoic acid (PFHpA)	370	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorooctanoic acid (PFOA)	330	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM
Perfluorooctanesulfonic acid (PFOS)	15000	200	ng/L	10	PF-19	SOP-454 PFAS	2/13/23	2/15/23 16:03	BLM
Perfluorononanoic acid (PFNA)	210	20	ng/L	1	MS-22	SOP-454 PFAS	2/13/23	2/15/23 11:05	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: PFW-2

Sampled: 1/31/2023 11:00

Sample ID: 23B0760-02

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)	130	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorobutanesulfonic acid (PFBS)	40	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluoropentanoic acid (PFPeA)	600	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorohexanoic acid (PFHxA)	630	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
11Cl-PF3OUdS (F53B Major)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
9Cl-PF3ONS (F53B Minor)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	160	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorodecanoic acid (PFDA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorododecanoic acid (PFDoA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
N-EtFOSAA (NEtFOSAA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
N-MeFOSAA (NMeFOSAA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorotetradecanoic acid (PFTA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorooctanesulfonamide (FOSA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorononanesulfonic acid (PFNS)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	150	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluoro-1-butanefulfonamide (FBFA)	87	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorohexanesulfonic acid (PFHxS)	620	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	1500	20	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluoropentanesulfonic acid (PFPeS)	61	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluoroundecanoic acid (PFUnA)	200	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluoroheptanoic acid (PFHpA)	190	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorooctanoic acid (PFOA)	250	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorooctanesulfonic acid (PFOS)	1600	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM
Perfluorononanoic acid (PFNA)	64	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:12	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: PFW-5

Sampled: 1/31/2023 09:15

Sample ID: 23B0760-03

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	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorobutanesulfonic acid (PFBS)	23	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluoropentanoic acid (PFPeA)	43	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorohexanoic acid (PFHxA)	62	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
11Cl-PF3OUdS (F53B Major)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
9Cl-PF3ONS (F53B Minor)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorodecanoic acid (PFDA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorododecanoic acid (PFDoA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
N-EtFOSAA (NEtFOSAA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
N-MeFOSAA (NMeFOSAA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorotetradecanoic acid (PFTA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorooctanesulfonamide (FOSA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorononanesulfonic acid (PFNS)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	38	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluoro-1-butanefulfonamide (FBFA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorohexanesulfonic acid (PFHxS)	580	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluoropentanesulfonic acid (PFPeS)	49	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluoroundecanoic acid (PFUnA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluoroheptanoic acid (PFHpA)	48	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorooctanoic acid (PFOA)	110	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorooctanesulfonic acid (PFOS)	1100	20	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM
Perfluorononanoic acid (PFNA)	24	20	ng/L	1	PF-20	SOP-454 PFAS	2/13/23	2/15/23 11:19	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Sampled: 1/31/2023 11:30

Field Sample #: OW-8A

Sample ID: 23B0760-04

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)	63	10	ng/L	1	PF-20	SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorobutanesulfonic acid (PFBS)	87	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluoropentanoic acid (PFPeA)	240	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorohexanoic acid (PFHxA)	580	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluoroheptanesulfonic acid (PFHpS)	34	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1	PF-19	SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	21	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluoro-1-butanefulfonamide (FBFA)	12	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorohexanesulfonic acid (PFHxS)	2000	100	ng/L	10		SOP-454 PFAS	2/13/23	2/15/23 16:11	RRB
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	15	10	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluoropentanesulfonic acid (PFPeS)	94	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluoroundecanoic acid (PFUnA)	11	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluoroheptanoic acid (PFHpA)	180	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorooctanoic acid (PFOA)	410	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorooctanesulfonic acid (PFOS)	480	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM
Perfluorononanoic acid (PFNA)	48	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:26	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: MW-3S

Sampled: 1/31/2023 10:30

Sample ID: 23B0760-05

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)	54	10	ng/L	1	PF-20	SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorobutanesulfonic acid (PFBS)	64	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluoropentanoic acid (PFPeA)	160	10	ng/L	1	PF-20	SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorohexanoic acid (PFHxA)	200	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluoroheptanesulfonic acid (PFHpS)	28	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	44	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorohexanesulfonic acid (PFHxS)	910	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	22	10	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluoropentanesulfonic acid (PFPeS)	71	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluoroundecanoic acid (PFUnA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluoroheptanoic acid (PFHpA)	81	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorooctanoic acid (PFOA)	220	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorooctanesulfonic acid (PFOS)	830	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM
Perfluorononanoic acid (PFNA)	24	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:34	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: MW-12S

Sampled: 2/1/2023 09:20

Sample ID: 23B0760-06

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	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorobutanesulfonic acid (PFBS)	18	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluoropentanoic acid (PFPeA)	160	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorohexanoic acid (PFHxA)	180	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluoroheptanesulfonic acid (PFHpS)	15	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorooctanesulfonamide (FOSA)	350	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	100	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluoro-1-butanefulfonamide (FBFA)	23	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorohexanesulfonic acid (PFHxS)	580	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	31	10	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluoropentanesulfonic acid (PFPeS)	24	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluoroundecanoic acid (PFUnA)	31	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluoroheptanoic acid (PFHpA)	66	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorooctanoic acid (PFOA)	190	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM
Perfluorooctanesulfonic acid (PFOS)	1100	100	ng/L	10	PF-19	SOP-454 PFAS	2/13/23	2/15/23 16:18	RRB
Perfluorononanoic acid (PFNA)	21	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:41	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: MW-22

Sampled: 2/1/2023 10:00

Sample ID: 23B0760-07

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	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluoropentanoic acid (PFPeA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorohexanoic acid (PFHxA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorohexanesulfonic acid (PFHxS)	25	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluoroundecanoic acid (PFUnA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluoroheptanoic acid (PFHpA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorooctanoic acid (PFOA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorooctanesulfonic acid (PFOS)	42	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM
Perfluorononanoic acid (PFNA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:48	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Sampled: 2/1/2023 13:30

Field Sample #: PC-1

Sample ID: 23B0760-08

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)	24	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluoropentanoic acid (PFPeA)	100	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorohexanoic acid (PFHxA)	91	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	24	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluoro-1-butanefulfonamide (FBSA)	15	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorohexanesulfonic acid (PFHxS)	110	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	220	10	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluoroundecanoic acid (PFUnA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluoroheptanoic acid (PFHpA)	41	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorooctanoic acid (PFOA)	35	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorooctanesulfonic acid (PFOS)	78	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM
Perfluorononanoic acid (PFNA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 11:55	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: PC-6A

Sampled: 2/1/2023 13:00

Sample ID: 23B0760-09

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)	17	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluoropentanoic acid (PFPeA)	45	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorohexanoic acid (PFHxA)	43	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorodecanoic acid (PFDA)	13	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	26	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorohexanesulfonic acid (PFHxS)	72	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12	10	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluoroundecanoic acid (PFUnA)	63	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluoroheptanoic acid (PFHpA)	37	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorooctanoic acid (PFOA)	29	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorooctanesulfonic acid (PFOS)	640	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM
Perfluorononanoic acid (PFNA)	58	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:03	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: PC-16D

Sampled: 2/1/2023 11:00

Sample ID: 23B0760-10

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)	11	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluoropentanoic acid (PFPeA)	36	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorohexanoic acid (PFHxA)	36	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	19	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorohexanesulfonic acid (PFHxS)	75	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	16	10	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluoroundecanoic acid (PFUnA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluoroheptanoic acid (PFHpA)	19	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorooctanoic acid (PFOA)	16	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorooctanesulfonic acid (PFOS)	290	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM
Perfluorononanoic acid (PFNA)	18	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:10	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: PC-28

Sampled: 2/1/2023 11:00

Sample ID: 23B0760-11

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)	26	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluoropentanoic acid (PFPeA)	75	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorohexanoic acid (PFHxA)	82	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	11	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorodecanoic acid (PFDA)	18	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluoroheptanesulfonic acid (PFHpS)	10	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	47	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluoro-1-butanefulfonamide (FBFA)	11	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorohexanesulfonic acid (PFHxS)	120	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	28	10	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluoropentanesulfonic acid (PFPeS)	10	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluoroundecanoic acid (PFUnA)	72	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluoroheptanoic acid (PFHpA)	66	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorooctanoic acid (PFOA)	48	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM
Perfluorooctanesulfonic acid (PFOS)	1200	100	ng/L	10	PF-19	SOP-454 PFAS	2/13/23	2/15/23 16:25	RRB
Perfluorononanoic acid (PFNA)	95	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:32	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: PC-30

Sampled: 2/1/2023 09:30

Sample ID: 23B0760-12

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)	22	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluoropentanoic acid (PFPeA)	65	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorohexanoic acid (PFHxA)	80	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	11	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorodecanoic acid (PFDA)	16	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluoroheptanesulfonic acid (PFHpS)	14	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	46	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluoro-1-butanefulfonamide (FBFA)	11	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorohexanesulfonic acid (PFHxS)	110	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	29	10	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluoropentanesulfonic acid (PFPeS)	11	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluoroundecanoic acid (PFUnA)	35	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluoroheptanoic acid (PFHpA)	54	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorooctanoic acid (PFOA)	45	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM
Perfluorooctanesulfonic acid (PFOS)	1100	100	ng/L	10	PF-19	SOP-454 PFAS	2/13/23	2/15/23 16:32	RRB
Perfluorononanoic acid (PFNA)	110	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:39	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: PC-34S

Sampled: 1/31/2023 10:00

Sample ID: 23B0760-13

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)	46	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorobutanesulfonic acid (PFBS)	25	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluoropentanoic acid (PFPeA)	140	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorohexanoic acid (PFHxA)	190	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	13	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorodecanoic acid (PFDA)	17	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluoroheptanesulfonic acid (PFHpS)	25	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	61	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluoro-1-butanefulfonamide (FBFA)	19	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorohexanesulfonic acid (PFHxS)	210	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	65	10	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluoropentanesulfonic acid (PFPeS)	27	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluoroundecanoic acid (PFUnA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluoroheptanoic acid (PFHpA)	110	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorooctanoic acid (PFOA)	94	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM
Perfluorooctanesulfonic acid (PFOS)	1500	100	ng/L	10	PF-19	SOP-454 PFAS	2/13/23	2/15/23 16:40	RRB
Perfluorononanoic acid (PFNA)	230	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:47	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: PC-39

Sampled: 2/1/2023 12:00

Sample ID: 23B0760-14

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)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluoropentanoic acid (PFPeA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorohexanoic acid (PFHxA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorohexanesulfonic acid (PFHxS)	13	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	20	10	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluoroundecanoic acid (PFUnA)	11	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluoroheptanoic acid (PFHpA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorooctanoic acid (PFOA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorooctanesulfonic acid (PFOS)	180	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM
Perfluorononanoic acid (PFNA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 12:54	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: Duplicate 1

Sampled: 2/1/2023 09:00

Sample ID: 23B0760-15

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)	19	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluoropentanoic acid (PFPeA)	59	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorohexanoic acid (PFHxA)	71	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorodecanoic acid (PFDA)	12	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluoroheptanesulfonic acid (PFHpS)	11	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	41	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorohexanesulfonic acid (PFHxS)	100	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	28	10	ng/L	1	L-05	SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluoroundecanoic acid (PFUnA)	26	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluoroheptanoic acid (PFHpA)	49	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorooctanoic acid (PFOA)	39	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM
Perfluorooctanesulfonic acid (PFOS)	1100	100	ng/L	10	PF-19	SOP-454 PFAS	2/13/23	2/15/23 16:47	RRB
Perfluorononanoic acid (PFNA)	89	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:01	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: Equipment Blank 1

Sampled: 1/31/2023 12:00

Sample ID: 23B0760-16

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	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluoropentanoic acid (PFPeA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorohexanoic acid (PFHxA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorohexanesulfonic acid (PFHxS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluoroundecanoic acid (PFUnA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluoroheptanoic acid (PFHpA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorooctanoic acid (PFOA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorooctanesulfonic acid (PFOS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM
Perfluorononanoic acid (PFNA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:08	BLM

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23B0760

Date Received: 2/6/2023

Field Sample #: Equipment Blank 2

Sampled: 2/1/2023 12:30

Sample ID: 23B0760-17

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	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorobutanesulfonic acid (PFBS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluoropentanoic acid (PFPeA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorohexanoic acid (PFHxA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
11Cl-PF3OUdS (F53B Major)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
9Cl-PF3ONS (F53B Minor)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorodecanoic acid (PFDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorododecanoic acid (PFDoA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluoroheptanesulfonic acid (PFHpS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
N-EtFOSAA (NEtFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
N-MeFOSAA (NMeFOSAA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorotetradecanoic acid (PFTA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorotridecanoic acid (PFTrDA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorodecanesulfonic acid (PFDS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorooctanesulfonamide (FOSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorononanesulfonic acid (PFNS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluoro-1-butanefulfonamide (FBFA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorohexanesulfonic acid (PFHxS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluoropentanesulfonic acid (PFPeS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluoroundecanoic acid (PFUnA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluoroheptanoic acid (PFHpA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorooctanoic acid (PFOA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorooctanesulfonic acid (PFOS)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM
Perfluorononanoic acid (PFNA)	ND	10	ng/L	1		SOP-454 PFAS	2/13/23	2/15/23 13:16	BLM

Sample Extraction Data

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23B0760-01 [PFW-1]	B330940	25.0	1.00	02/13/23
23B0760-01RE1 [PFW-1]	B330940	25.0	1.00	02/13/23
23B0760-02 [PFW-2]	B330940	25.0	1.00	02/13/23
23B0760-03 [PFW-5]	B330940	25.0	1.00	02/13/23
23B0760-04 [OW-8A]	B330940	50.0	1.00	02/13/23
23B0760-04RE1 [OW-8A]	B330940	50.0	1.00	02/13/23
23B0760-05 [MW-3S]	B330940	47.9	1.00	02/13/23
23B0760-06 [MW-12S]	B330940	48.4	1.00	02/13/23
23B0760-06RE1 [MW-12S]	B330940	48.4	1.00	02/13/23
23B0760-07 [MW-22]	B330940	48.2	1.00	02/13/23
23B0760-08 [PC-1]	B330940	49.1	1.00	02/13/23
23B0760-09 [PC-6A]	B330940	49.4	1.00	02/13/23
23B0760-10 [PC-16D]	B330940	48.6	1.00	02/13/23
23B0760-11 [PC-28]	B330940	48.6	1.00	02/13/23
23B0760-11RE1 [PC-28]	B330940	48.6	1.00	02/13/23
23B0760-12 [PC-30]	B330940	49.1	1.00	02/13/23
23B0760-12RE1 [PC-30]	B330940	49.1	1.00	02/13/23
23B0760-13 [PC-34S]	B330940	48.8	1.00	02/13/23
23B0760-13RE1 [PC-34S]	B330940	48.8	1.00	02/13/23
23B0760-14 [PC-39]	B330940	48.8	1.00	02/13/23
23B0760-15 [Duplicate 1]	B330940	47.7	1.00	02/13/23
23B0760-15RE1 [Duplicate 1]	B330940	47.7	1.00	02/13/23
23B0760-16 [Equipment Blank 1]	B330940	48.9	1.00	02/13/23
23B0760-17 [Equipment Blank 2]	B330940	49.0	1.00	02/13/23

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

Batch B330940 - SOP 454-PFAAS
Blank (B330940-BLK1)

Prepared: 02/13/23 Analyzed: 02/15/23

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-butanefulfonamide (FBFA)	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 (B330940-BS1)

Prepared: 02/13/23 Analyzed: 02/15/23

Perfluorobutanoic acid (PFBA)	11.5	1.9	ng/L	9.42	122	73-129
Perfluorobutanesulfonic acid (PFBS)	10.0	1.9	ng/L	8.33	120	72-130
Perfluoropentanoic acid (PFPeA)	11.4	1.9	ng/L	9.42	121	72-129
Perfluorohexanoic acid (PFHxA)	11.2	1.9	ng/L	9.42	119	72-129
11Cl-PF3OUdS (F53B Major)	8.53	1.9	ng/L	8.87	96.1	55.1-141
9Cl-PF3ONS (F53B Minor)	8.62	1.9	ng/L	8.78	98.2	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	10.1	1.9	ng/L	8.87	113	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	11.0	1.9	ng/L	9.42	117	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	10.1	1.9	ng/L	9.04	112	67-138
Perfluorodecanoic acid (PFDA)	11.8	1.9	ng/L	9.42	125	71-129
Perfluorododecanoic acid (PFDoA)	12.0	1.9	ng/L	9.42	128	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	10.0	1.9	ng/L	8.38	120	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

Batch B330940 - SOP 454-PFAAS
LCS (B330940-BS1)

Prepared: 02/13/23 Analyzed: 02/15/23

Perfluoroheptanesulfonic acid (PFHpS)	10.7	1.9	ng/L	8.99		119	69-134			
N-EtFOSAA (NEtFOSAA)	12.9	1.9	ng/L	9.42		137	* 61-135			L-01
N-MeFOSAA (NMeFOSAA)	12.9	1.9	ng/L	9.42		137	* 65-136			L-01
Perfluorotetradecanoic acid (PFTA)	12.5	1.9	ng/L	9.42		132	71-132			
Perfluorotridecanoic acid (PFTrDA)	12.1	1.9	ng/L	9.42		129	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.1	1.9	ng/L	8.81		115	63-143			
Perfluorodecanesulfonic acid (PFDS)	9.20	1.9	ng/L	9.09		101	53-142			
Perfluorooctanesulfonamide (FOSA)	11.6	1.9	ng/L	9.42		123	67-137			
Perfluorononanesulfonic acid (PFNS)	9.51	1.9	ng/L	9.04		105	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	11.5	1.9	ng/L	9.42		122	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	10.4	1.9	ng/L	9.42		111	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	9.91	1.9	ng/L	8.62		115	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	12.4	1.9	ng/L	9.42		131	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	11.7	1.9	ng/L	9.42		124	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	13.4	1.9	ng/L	8.95		150	* 64-140			L-05
Perfluoropentanesulfonic acid (PFPeS)	10.6	1.9	ng/L	8.85		120	71-127			
Perfluoroundecanoic acid (PFUnA)	11.7	1.9	ng/L	9.42		124	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	10.8	1.9	ng/L	9.42		114	58.5-143			
Perfluoroheptanoic acid (PFHpA)	11.2	1.9	ng/L	9.42		119	72-130			
Perfluorooctanoic acid (PFOA)	11.6	1.9	ng/L	9.42		123	71-133			
Perfluorooctanesulfonic acid (PFOS)	9.78	1.9	ng/L	8.71		112	65-140			
Perfluorononanoic acid (PFNA)	11.7	1.9	ng/L	9.42		125	69-130			

Matrix Spike (B330940-MS1)
Source: 23B0760-01

Prepared: 02/13/23 Analyzed: 02/15/23

Perfluorobutanoic acid (PFBA)	289	20	ng/L	100	166	123	73-129			
Perfluorobutanesulfonic acid (PFBS)	173	20	ng/L	88.5	62.6	124	72-130			
Perfluoropentanoic acid (PFPeA)	736	20	ng/L	100	605	130	* 72-129			MS-22
Perfluorohexanoic acid (PFHxA)	761	20	ng/L	100	612	149	* 72-129			MS-22
11Cl-PF3OUdS (F53B Major)	138	20	ng/L	94.2	ND	147	* 58.3-140			MS-12
9Cl-PF3ONS (F53B Minor)	139	20	ng/L	93.2	ND	149	* 61.4-144			MS-12
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	101	20	ng/L	94.2	ND	107	62.4-128			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	115	20	ng/L	100	ND	115	36.7-171			
8:2 Fluorotelomersulfonic acid (8:2FTS A)	1540	20	ng/L	96.0	1290	261	* 67-138			MS-12
Perfluorodecanoic acid (PFDA)	212	20	ng/L	100	77.5	135	* 71-129			MS-22
Perfluorododecanoic acid (PFDoA)	125	20	ng/L	100	ND	125	72-134			
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	105	20	ng/L	89.0	ND	118	54.3-149			
Perfluoroheptanesulfonic acid (PFHpS)	318	20	ng/L	95.5	149	177	* 69-134			MS-12
N-EtFOSAA (NEtFOSAA)	122	20	ng/L	100	ND	122	61-135			
N-MeFOSAA (NMeFOSAA)	139	20	ng/L	100	ND	139	* 65-136			MS-22
Perfluorotetradecanoic acid (PFTA)	133	20	ng/L	100	ND	133	* 71-132			MS-12
Perfluorotridecanoic acid (PFTrDA)	127	20	ng/L	100	ND	127	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	110	20	ng/L	93.5	ND	118	63-143			
Perfluorodecanesulfonic acid (PFDS)	122	20	ng/L	96.5	20.2	105	53-142			
Perfluorooctanesulfonamide (FOSA)	119	20	ng/L	100	8.69	111	67-137			
Perfluorononanesulfonic acid (PFNS)	260	20	ng/L	96.0	85.3	182	* 69-127			MS-12
Perfluoro-1-hexanesulfonamide (FHxSA)	2390	20	ng/L	100	2180	214	* 64.2-154			E, MS-22
Perfluoro-1-butanefulfonamide (FBSA)	229	20	ng/L	100	109	121	65.9-140			
Perfluorohexanesulfonic acid (PFHxS)	1540	20	ng/L	91.5	1490	54.6	* 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
Batch B330940 - SOP 454-PFAAS										
Matrix Spike (B330940-MS1)	Source: 23B0760-01			Prepared: 02/13/23 Analyzed: 02/15/23						
Perfluoro-4-oxapentanoic acid (PFMPA)	135	20	ng/L	100	ND	135	61.9-143			
Perfluoro-5-oxahexanoic acid (PFMBA)	121	20	ng/L	100	ND	121	61.4-142			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	783	20	ng/L	95.0	643	147 *	64-140			MS-22
Perfluoropetanesulfonic acid (PFPeS)	277	20	ng/L	94.0	155	130 *	71-127			MS-22
Perfluoroundecanoic acid (PFUnA)	221	20	ng/L	100	128	93.1	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	116	20	ng/L	100	ND	116	62-138			
Perfluoroheptanoic acid (PFHpA)	476	20	ng/L	100	365	111	72-130			
Perfluorooctanoic acid (PFOA)	436	20	ng/L	100	325	111	71-133			
Perfluorooctanesulfonic acid (PFOS)	10700	20	ng/L	92.5	10300	420 *	65-140			E, MS-19
Perfluorononanoic acid (PFNA)	344	20	ng/L	100	205	138 *	69-130			MS-22
Matrix Spike Dup (B330940-MSD1)	Source: 23B0760-01			Prepared: 02/13/23 Analyzed: 02/15/23						
Perfluorobutanoic acid (PFBA)	278	20	ng/L	100	166	112	73-129	3.77	30	
Perfluorobutanesulfonic acid (PFBS)	171	20	ng/L	88.5	62.6	122	72-130	1.15	30	
Perfluoropentanoic acid (PFPeA)	693	20	ng/L	100	605	88.1	72-129	5.91	30	
Perfluorohexanoic acid (PFHxA)	698	20	ng/L	100	612	86.6	72-129	8.60	30	
11Cl-PF3OUdS (F53B Major)	143	20	ng/L	94.2	ND	152 *	58.3-140	3.65	30	MS-12
9Cl-PF3ONS (F53B Minor)	137	20	ng/L	93.2	ND	147 *	61.4-144	0.953	30	MS-12
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	105	20	ng/L	94.2	ND	112	62.4-128	4.18	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	139	20	ng/L	100	ND	139	36.7-171	19.5	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	1420	20	ng/L	96.0	1290	140 *	67-138	7.78	30	MS-12
Perfluorodecanoic acid (PFDA)	205	20	ng/L	100	77.5	127	71-129	3.46	30	
Perfluorododecanoic acid (PFDoA)	126	20	ng/L	100	ND	126	72-134	1.20	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	106	20	ng/L	89.0	ND	120	54.3-149	1.57	30	
Perfluoroheptanesulfonic acid (PFHpS)	292	20	ng/L	95.5	149	149 *	69-134	8.71	30	MS-12
N-EtFOSAA (NEtFOSAA)	143	20	ng/L	100	ND	143 *	61-135	15.5	30	MS-22
N-MeFOSAA (NMeFOSAA)	131	20	ng/L	100	ND	131	65-136	5.98	30	
Perfluorotetradecanoic acid (PFTA)	136	20	ng/L	100	ND	136 *	71-132	2.56	30	MS-12
Perfluorotridecanoic acid (PFTrDA)	139	20	ng/L	100	ND	139	65-144	8.99	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	117	20	ng/L	93.5	ND	125	63-143	6.24	30	
Perfluorodecanesulfonic acid (PFDS)	119	20	ng/L	96.5	20.2	102	53-142	2.08	30	
Perfluorooctanesulfonamide (FOSA)	119	20	ng/L	100	8.69	110	67-137	0.715	30	
Perfluorononanesulfonic acid (PFNS)	232	20	ng/L	96.0	85.3	153 *	69-127	11.1	30	MS-12
Perfluoro-1-hexanesulfonamide (FHxSA)	2240	20	ng/L	100	2180	67.6	64.2-154	6.33	30	E
Perfluoro-1-butanesulfonamide (FBSA)	218	20	ng/L	100	109	110	65.9-140	4.83	30	
Perfluorohexanesulfonic acid (PFHxS)	1430	20	ng/L	91.5	1490	-62.5 *	68-131	7.23	30	MS-19
Perfluoro-4-oxapentanoic acid (PFMPA)	139	20	ng/L	100	ND	139	61.9-143	2.91	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	127	20	ng/L	100	ND	127	61.4-142	4.07	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	764	20	ng/L	95.0	643	127	64-140	2.43	30	
Perfluoropetanesulfonic acid (PFPeS)	262	20	ng/L	94.0	155	114	71-127	5.59	30	
Perfluoroundecanoic acid (PFUnA)	242	20	ng/L	100	128	114	69-133	9.08	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	118	20	ng/L	100	ND	118	62-138	1.87	30	
Perfluoroheptanoic acid (PFHpA)	456	20	ng/L	100	365	91.3	72-130	4.24	30	
Perfluorooctanoic acid (PFOA)	409	20	ng/L	100	325	83.3	71-133	6.55	30	
Perfluorooctanesulfonic acid (PFOS)	9900	20	ng/L	92.5	10300	-391 *	65-140	7.31	30	E, MS-19
Perfluorononanoic acid (PFNA)	324	20	ng/L	100	205	119	69-130	5.76	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.
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-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.
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
PFW-1 (23B0760-01) Lab File ID: 23B0760-01.d Analyzed: 02/15/23 11:05									
M8FOSA	232691.8	3.924617	310,268.00	3.924617	75	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	66802.89	2.480383	102,003.00	2.4804	65	50 - 150	0.0000	+/-0.50	
M2PFTA	582993	4.297266	791,057.00	4.297266	74	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	139241.6	3.76295	134,679.00	3.76295	103	50 - 150	0.0000	+/-0.50	
MPFBA	321983.8	1.04185	392,126.00	1.04185	82	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	97835.74	2.822933	126,392.00	2.81475	77	50 - 150	0.0082	+/-0.50	
M6PFDA	562295.8	3.763467	633,738.00	3.763467	89	50 - 150	0.0000	+/-0.50	
M3PFBS	107800.9	1.886667	122,987.00	1.878383	88	50 - 150	0.0083	+/-0.50	
M7PFUnA	536289.9	3.914067	640,988.00	3.914067	84	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	63446.03	3.4044	79,262.00	3.4044	80	50 - 150	0.0000	+/-0.50	
M5PFPeA	340390.8	1.706567	385,422.00	1.706567	88	50 - 150	0.0000	+/-0.50	
M5PFHxA	515694.8	2.572333	568,727.00	2.564117	91	50 - 150	0.0082	+/-0.50	
M3PFHxS	73055.53	3.177667	86,613.00	3.17765	84	50 - 150	0.0000	+/-0.50	
M4PFHpA	534923.7	3.14655	607,093.00	3.138483	88	50 - 150	0.0081	+/-0.50	
M8PFOA	580042	3.421167	635,085.00	3.413117	91	50 - 150	0.0080	+/-0.50	
M8PFOS	54375.47	3.60425	89,742.00	3.60425	61	50 - 150	0.0000	+/-0.50	
M9PFNA	352440	3.605283	579,089.00	3.605283	61	50 - 150	0.0000	+/-0.50	
MPFDoA	490894.1	4.048683	598,588.00	4.048683	82	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	141415.1	3.921533	173,520.00	3.921533	81	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	182207	3.84175	216,811.00	3.84175	84	50 - 150	0.0000	+/-0.50	
PFW-1 (23B0760-01RE1) Lab File ID: 23B0760-01RE1.d Analyzed: 02/15/23 16:03									
M8PFOA	636943.4	3.413117	635,085.00	3.413117	100	50 - 150	0.0000	+/-0.50	
M8PFOS	83658.2	3.596267	89,742.00	3.60425	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
PFW-2 (23B0760-02)		Lab File ID: 23B0760-02.d				Analyzed: 02/15/23 11:12			
M8FOSA	220624.8	3.924617	310,268.00	3.924617	71	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	62434.06	2.480383	102,003.00	2.4804	61	50 - 150	0.0000	+/-0.50	
M2PFTA	605949.9	4.297283	791,057.00	4.297266	77	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	111481.3	3.76295	134,679.00	3.76295	83	50 - 150	0.0000	+/-0.50	
MPFBA	304194	1.04185	392,126.00	1.04185	78	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	102291.7	2.81475	126,392.00	2.81475	81	50 - 150	0.0000	+/-0.50	
M6PFDA	590666.4	3.763467	633,738.00	3.763467	93	50 - 150	0.0000	+/-0.50	
M3PFBS	109467.1	1.878383	122,987.00	1.878383	89	50 - 150	0.0000	+/-0.50	
M7PFUnA	566347.6	3.91405	640,988.00	3.914067	88	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	74413.05	3.4044	79,262.00	3.4044	94	50 - 150	0.0000	+/-0.50	
M5PFPeA	339755.1	1.706567	385,422.00	1.706567	88	50 - 150	0.0000	+/-0.50	
M5PFHxA	510847.1	2.572333	568,727.00	2.564117	90	50 - 150	0.0082	+/-0.50	
M3PFHxS	76057.45	3.17765	86,613.00	3.17765	88	50 - 150	0.0000	+/-0.50	
M4PFHpA	538528.7	3.14655	607,093.00	3.138483	89	50 - 150	0.0081	+/-0.50	
M8PFOA	588248.8	3.421167	635,085.00	3.413117	93	50 - 150	0.0080	+/-0.50	
M8PFOS	74387.69	3.60425	89,742.00	3.60425	83	50 - 150	0.0000	+/-0.50	
M9PFNA	500142.6	3.605283	579,089.00	3.605283	86	50 - 150	0.0000	+/-0.50	
MPFDoA	492746.6	4.048683	598,588.00	4.048683	82	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	147641.3	3.921533	173,520.00	3.921533	85	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	192276.1	3.841733	216,811.00	3.84175	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
PFW-5 (23B0760-03) Lab File ID: 23B0760-03.d Analyzed: 02/15/23 11:19									
M8FOSA	177338.5	3.924633	310,268.00	3.924617	57	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	51955.03	2.480383	102,003.00	2.4804	51	50 - 150	0.0000	+/-0.50	
M2PFTA	533535.7	4.2973	791,057.00	4.297266	67	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	86913.76	3.762967	134,679.00	3.76295	65	50 - 150	0.0000	+/-0.50	
MPFBA	313615.1	1.04185	392,126.00	1.04185	80	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	111661.4	2.81475	126,392.00	2.81475	88	50 - 150	0.0000	+/-0.50	
M6PFDA	537315.5	3.763483	633,738.00	3.763467	85	50 - 150	0.0000	+/-0.50	
M3PFBS	105423.4	1.878383	122,987.00	1.878383	86	50 - 150	0.0000	+/-0.50	
M7PFUnA	494032.6	3.914083	640,988.00	3.914067	77	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	48672.38	3.4044	79,262.00	3.4044	61	50 - 150	0.0000	+/-0.50	
M5PFPeA	325827.4	1.706567	385,422.00	1.706567	85	50 - 150	0.0000	+/-0.50	
M5PFHxA	494134.7	2.572333	568,727.00	2.564117	87	50 - 150	0.0082	+/-0.50	
M3PFHxS	75728.27	3.177667	86,613.00	3.17765	87	50 - 150	0.0000	+/-0.50	
M4PFHpA	514575.9	3.14655	607,093.00	3.138483	85	50 - 150	0.0081	+/-0.50	
M8PFOA	559213.1	3.421183	635,085.00	3.413117	88	50 - 150	0.0081	+/-0.50	
M8PFOS	75336.02	3.60425	89,742.00	3.60425	84	50 - 150	0.0000	+/-0.50	
M9PFNA	503597.9	3.605283	579,089.00	3.605283	87	50 - 150	0.0000	+/-0.50	
MPFDoA	436253	4.0487	598,588.00	4.048683	73	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	122552.1	3.92155	173,520.00	3.921533	71	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	172139.5	3.841767	216,811.00	3.84175	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
OW-8A (23B0760-04) Lab File ID: 23B0760-04.d Analyzed: 02/15/23 11:26									
M8FOSA	231612.7	3.924633	310,268.00	3.924617	75	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	151587.2	2.472183	102,003.00	2.4804	149	50 - 150	-0.0082	+/-0.50	
M2PFTA	643869.8	4.289217	791,057.00	4.297266	81	50 - 150	-0.0080	+/-0.50	
M2-8:2FTS	137333.2	3.762967	134,679.00	3.76295	102	50 - 150	0.0000	+/-0.50	
MPFBA	179037.7	1.04185	392,126.00	1.04185	46	50 - 150	0.0000	+/-0.50	*
M3HFPO-DA	79247.32	2.814767	126,392.00	2.81475	63	50 - 150	0.0000	+/-0.50	
M6PFDA	587271.8	3.763483	633,738.00	3.763467	93	50 - 150	0.0000	+/-0.50	
M3PFBS	118568.1	1.8701	122,987.00	1.878383	96	50 - 150	-0.0083	+/-0.50	
M7PFUnA	643435.6	3.914067	640,988.00	3.914067	100	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	110491.5	3.4044	79,262.00	3.4044	139	50 - 150	0.0000	+/-0.50	
M5PFPeA	319774.2	1.698283	385,422.00	1.706567	83	50 - 150	-0.0083	+/-0.50	
M5PFHxA	577805.3	2.564133	568,727.00	2.564117	102	50 - 150	0.0000	+/-0.50	
M3PFHxS	79281	3.177667	86,613.00	3.17765	92	50 - 150	0.0000	+/-0.50	
M4PFHpA	597943.7	3.138483	607,093.00	3.138483	98	50 - 150	0.0000	+/-0.50	
M8PFOA	645598	3.413133	635,085.00	3.413117	102	50 - 150	0.0000	+/-0.50	
M8PFOS	78929.81	3.604267	89,742.00	3.60425	88	50 - 150	0.0000	+/-0.50	
M9PFNA	587051.8	3.6053	579,089.00	3.605283	101	50 - 150	0.0000	+/-0.50	
MPFDoA	536657.4	4.0487	598,588.00	4.048683	90	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	171638	3.91355	173,520.00	3.921533	99	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	214711.6	3.84175	216,811.00	3.84175	99	50 - 150	0.0000	+/-0.50	
OW-8A (23B0760-04RE1) Lab File ID: 23B0760-04RE1.d Analyzed: 02/15/23 16:11									
M3PFHxS	89360.21	3.169583	86,613.00	3.169583	103	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-3S (23B0760-05) Lab File ID: 23B0760-05.d Analyzed: 02/15/23 11:34									
M8FOSA	239036.8	3.924633	310,268.00	3.924617	77	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	139034.5	2.4804	102,003.00	2.4804	136	50 - 150	0.0000	+/-0.50	
M2PFTA	527220.4	4.297283	791,057.00	4.297266	67	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	151002	3.762967	134,679.00	3.76295	112	50 - 150	0.0000	+/-0.50	
MPFBA	201351.3	1.04185	392,126.00	1.04185	51	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	89638.6	2.814767	126,392.00	2.81475	71	50 - 150	0.0000	+/-0.50	
M6PFDA	588398.5	3.763483	633,738.00	3.763467	93	50 - 150	0.0000	+/-0.50	
M3PFBS	119495.9	1.878383	122,987.00	1.878383	97	50 - 150	0.0000	+/-0.50	
M7PFUnA	631389.3	3.914067	640,988.00	3.914067	99	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	115973.2	3.4044	79,262.00	3.4044	146	50 - 150	0.0000	+/-0.50	
M5PFPeA	332606	1.698283	385,422.00	1.706567	86	50 - 150	-0.0083	+/-0.50	
M5PFHxA	583130.2	2.564133	568,727.00	2.564117	103	50 - 150	0.0000	+/-0.50	
M3PFHxS	82693.88	3.177667	86,613.00	3.17765	95	50 - 150	0.0000	+/-0.50	
M4PFHpA	596489.6	3.138483	607,093.00	3.138483	98	50 - 150	0.0000	+/-0.50	
M8PFOA	655741.4	3.413133	635,085.00	3.413117	103	50 - 150	0.0000	+/-0.50	
M8PFOS	80082.85	3.60425	89,742.00	3.60425	89	50 - 150	0.0000	+/-0.50	
M9PFNA	582353	3.605283	579,089.00	3.605283	101	50 - 150	0.0000	+/-0.50	
MPFDoA	491991	4.048683	598,588.00	4.048683	82	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	166204.8	3.91355	173,520.00	3.921533	96	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	208191.6	3.84175	216,811.00	3.84175	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
MW-12S (23B0760-06) Lab File ID: 23B0760-06.d Analyzed: 02/15/23 11:41									
M8FOSA	222386.8	3.924633	310,268.00	3.924617	72	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	68117.3	2.4804	102,003.00	2.4804	67	50 - 150	0.0000	+/-0.50	
M2PFTA	639750.5	4.2973	791,057.00	4.297266	81	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	124146.5	3.762967	134,679.00	3.76295	92	50 - 150	0.0000	+/-0.50	
MPFBA	241582.3	1.04185	392,126.00	1.04185	62	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	108147.8	2.814767	126,392.00	2.81475	86	50 - 150	0.0000	+/-0.50	
M6PFDA	572946.6	3.7635	633,738.00	3.763467	90	50 - 150	0.0000	+/-0.50	
M3PFBS	115087.3	1.8784	122,987.00	1.878383	94	50 - 150	0.0000	+/-0.50	
M7PFUnA	565761.5	3.914083	640,988.00	3.914067	88	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	58206.09	3.404417	79,262.00	3.4044	73	50 - 150	0.0000	+/-0.50	
M5PFPeA	343197.9	1.706567	385,422.00	1.706567	89	50 - 150	0.0000	+/-0.50	
M5PFHxA	528784.7	2.57235	568,727.00	2.564117	93	50 - 150	0.0082	+/-0.50	
M3PFHxS	77769.09	3.177667	86,613.00	3.17765	90	50 - 150	0.0000	+/-0.50	
M4PFHpA	572599.9	3.146567	607,093.00	3.138483	94	50 - 150	0.0081	+/-0.50	
M8PFOA	602048	3.413133	635,085.00	3.413117	95	50 - 150	0.0000	+/-0.50	
M8PFOS	77769.21	3.604267	89,742.00	3.60425	87	50 - 150	0.0000	+/-0.50	
M9PFNA	515896.6	3.6053	579,089.00	3.605283	89	50 - 150	0.0000	+/-0.50	
MPFDoA	507328.7	4.0487	598,588.00	4.048683	85	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	137513.2	3.92155	173,520.00	3.921533	79	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	187780.4	3.841767	216,811.00	3.84175	87	50 - 150	0.0000	+/-0.50	
MW-12S (23B0760-06RE1) Lab File ID: 23B0760-06RE1.d Analyzed: 02/15/23 16:18									
M8PFOS	88737.88	3.59625	89,742.00	3.60425	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
MW-22 (23B0760-07)		Lab File ID: 23B0760-07.d				Analyzed: 02/15/23 11:48			
M8FOSA	238909.7	3.924617	310,268.00	3.924617	77	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	55241.28	2.4804	102,003.00	2.4804	54	50 - 150	0.0000	+/-0.50	
M2PFTA	680866.9	4.297266	791,057.00	4.297266	86	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	102624.2	3.76295	134,679.00	3.76295	76	50 - 150	0.0000	+/-0.50	
MPFBA	340580.2	1.04185	392,126.00	1.04185	87	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	107361.4	2.81475	126,392.00	2.81475	85	50 - 150	0.0000	+/-0.50	
M6PFDA	594769	3.763483	633,738.00	3.763467	94	50 - 150	0.0000	+/-0.50	
M3PFBS	113542.9	1.878383	122,987.00	1.878383	92	50 - 150	0.0000	+/-0.50	
M7PFUnA	552618.3	3.914067	640,988.00	3.914067	86	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	51288.63	3.4044	79,262.00	3.4044	65	50 - 150	0.0000	+/-0.50	
M5PFPeA	352358.8	1.706567	385,422.00	1.706567	91	50 - 150	0.0000	+/-0.50	
M5PFHxA	528097.3	2.572333	568,727.00	2.564117	93	50 - 150	0.0082	+/-0.50	
M3PFHxS	83673.44	3.177667	86,613.00	3.17765	97	50 - 150	0.0000	+/-0.50	
M4PFHpA	566931.4	3.14655	607,093.00	3.138483	93	50 - 150	0.0081	+/-0.50	
M8PFOA	609346	3.421167	635,085.00	3.413117	96	50 - 150	0.0080	+/-0.50	
M8PFOS	88209.05	3.60425	89,742.00	3.60425	98	50 - 150	0.0000	+/-0.50	
M9PFNA	528368.6	3.605283	579,089.00	3.605283	91	50 - 150	0.0000	+/-0.50	
MPFDoA	503447.3	4.048683	598,588.00	4.048683	84	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	144388.9	3.921533	173,520.00	3.921533	83	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	190806.6	3.84175	216,811.00	3.84175	88	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 (23B0760-08)		Lab File ID: 23B0760-08.d				Analyzed: 02/15/23 11:55			
M8FOSA	243546.8	3.924617	310,268.00	3.924617	78	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	52500.26	2.480383	102,003.00	2.4804	51	50 - 150	0.0000	+/-0.50	
M2PFTA	687425.3	4.297266	791,057.00	4.297266	87	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	94111.91	3.76295	134,679.00	3.76295	70	50 - 150	0.0000	+/-0.50	
MPFBA	341151.9	1.04185	392,126.00	1.04185	87	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	109955.3	2.81475	126,392.00	2.81475	87	50 - 150	0.0000	+/-0.50	
M6PFDA	585505.3	3.763467	633,738.00	3.763467	92	50 - 150	0.0000	+/-0.50	
M3PFBS	119239.5	1.878383	122,987.00	1.878383	97	50 - 150	0.0000	+/-0.50	
M7PFUnA	537398.6	3.914067	640,988.00	3.914067	84	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	51348.66	3.4044	79,262.00	3.4044	65	50 - 150	0.0000	+/-0.50	
M5PFPeA	366966	1.706567	385,422.00	1.706567	95	50 - 150	0.0000	+/-0.50	
M5PFHxA	557582.1	2.572333	568,727.00	2.564117	98	50 - 150	0.0082	+/-0.50	
M3PFHxS	85537.6	3.17765	86,613.00	3.17765	99	50 - 150	0.0000	+/-0.50	
M4PFHpA	593529.6	3.14655	607,093.00	3.138483	98	50 - 150	0.0081	+/-0.50	
M8PFOA	637922	3.413117	635,085.00	3.413117	100	50 - 150	0.0000	+/-0.50	
M8PFOS	82391.79	3.60425	89,742.00	3.60425	92	50 - 150	0.0000	+/-0.50	
M9PFNA	560062	3.605283	579,089.00	3.605283	97	50 - 150	0.0000	+/-0.50	
MPFDoA	517313.4	4.048683	598,588.00	4.048683	86	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	128786.7	3.921533	173,520.00	3.921533	74	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	170685.1	3.84175	216,811.00	3.84175	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
PC-6A (23B0760-09) Lab File ID: 23B0760-09.d Analyzed: 02/15/23 12:03									
M8FOSA	217766.7	3.924633	310,268.00	3.924617	70	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	48867.5	2.4804	102,003.00	2.4804	48	50 - 150	0.0000	+/-0.50	*
M2PFTA	554610.5	4.297283	791,057.00	4.297266	70	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	89711.31	3.76295	134,679.00	3.76295	67	50 - 150	0.0000	+/-0.50	
MPFBA	281800.6	1.04185	392,126.00	1.04185	72	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	103565.1	2.81475	126,392.00	2.81475	82	50 - 150	0.0000	+/-0.50	
M6PFDA	519585.9	3.763483	633,738.00	3.763467	82	50 - 150	0.0000	+/-0.50	
M3PFBS	101534.7	1.878383	122,987.00	1.878383	83	50 - 150	0.0000	+/-0.50	
M7PFUnA	507902.6	3.914067	640,988.00	3.914067	79	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	45700.96	3.4044	79,262.00	3.4044	58	50 - 150	0.0000	+/-0.50	
M5PFPeA	316356.4	1.706567	385,422.00	1.706567	82	50 - 150	0.0000	+/-0.50	
M5PFHxA	479206.2	2.572333	568,727.00	2.564117	84	50 - 150	0.0082	+/-0.50	
M3PFHxS	75179.54	3.177667	86,613.00	3.17765	87	50 - 150	0.0000	+/-0.50	
M4PFHpA	505256.7	3.14655	607,093.00	3.138483	83	50 - 150	0.0081	+/-0.50	
M8PFOA	548761.6	3.421183	635,085.00	3.413117	86	50 - 150	0.0081	+/-0.50	
M8PFOS	69891.76	3.60425	89,742.00	3.60425	78	50 - 150	0.0000	+/-0.50	
M9PFNA	463678.9	3.605283	579,089.00	3.605283	80	50 - 150	0.0000	+/-0.50	
MPFDoA	457895.8	4.0487	598,588.00	4.048683	76	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	128265.2	3.921533	173,520.00	3.921533	74	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	173812.8	3.84175	216,811.00	3.84175	80	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 (23B0760-10)		Lab File ID: 23B0760-10.d				Analyzed: 02/15/23 12:10			
M8FOSA	243437.9	3.924617	310,268.00	3.924617	78	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	51652.29	2.480383	102,003.00	2.4804	51	50 - 150	0.0000	+/-0.50	
M2PFTA	646125.5	4.297283	791,057.00	4.297266	82	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	98391.2	3.762967	134,679.00	3.76295	73	50 - 150	0.0000	+/-0.50	
MPFBA	315642.7	1.04185	392,126.00	1.04185	80	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	127622.4	2.822933	126,392.00	2.81475	101	50 - 150	0.0082	+/-0.50	
M6PFDA	573578.8	3.763483	633,738.00	3.763467	91	50 - 150	0.0000	+/-0.50	
M3PFBS	114667.2	1.886667	122,987.00	1.878383	93	50 - 150	0.0083	+/-0.50	
M7PFUnA	585565.5	3.914067	640,988.00	3.914067	91	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	44444.75	3.4044	79,262.00	3.4044	56	50 - 150	0.0000	+/-0.50	
M5PFPeA	351323.8	1.706567	385,422.00	1.706567	91	50 - 150	0.0000	+/-0.50	
M5PFHxA	536108.4	2.572333	568,727.00	2.564117	94	50 - 150	0.0082	+/-0.50	
M3PFHxS	85023.04	3.17765	86,613.00	3.17765	98	50 - 150	0.0000	+/-0.50	
M4PFHpA	578089.3	3.14655	607,093.00	3.138483	95	50 - 150	0.0081	+/-0.50	
M8PFOA	609088.8	3.421183	635,085.00	3.413117	96	50 - 150	0.0081	+/-0.50	
M8PFOS	80546.43	3.60425	89,742.00	3.60425	90	50 - 150	0.0000	+/-0.50	
M9PFNA	565588.2	3.605283	579,089.00	3.605283	98	50 - 150	0.0000	+/-0.50	
MPFDoA	550082.6	4.048683	598,588.00	4.048683	92	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	144945.7	3.921533	173,520.00	3.921533	84	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	185349.6	3.84175	216,811.00	3.84175	85	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 (23B0760-11) Lab File ID: 23B0760-11.d Analyzed: 02/15/23 12:32									
M8FOSA	243273.3	3.924617	310,268.00	3.924633	78	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	53136.96	2.4804	102,003.00	2.4804	52	50 - 150	0.0000	+/-0.50	
M2PFTA	631053.4	4.297266	791,057.00	4.297283	80	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	101018.7	3.76295	134,679.00	3.762967	75	50 - 150	0.0000	+/-0.50	
MPFBA	317348.2	1.04185	392,126.00	1.04185	81	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	115954.8	2.81475	126,392.00	2.81475	92	50 - 150	0.0000	+/-0.50	
M6PFDA	571359.8	3.763467	633,738.00	3.763483	90	50 - 150	0.0000	+/-0.50	
M3PFBS	113232.4	1.878383	122,987.00	1.8784	92	50 - 150	0.0000	+/-0.50	
M7PFUnA	538330.8	3.914067	640,988.00	3.914067	84	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	48505.86	3.4044	79,262.00	3.4044	61	50 - 150	0.0000	+/-0.50	
M5PFPeA	354303.6	1.706567	385,422.00	1.698283	92	50 - 150	0.0083	+/-0.50	
M5PFHxA	533632.1	2.564133	568,727.00	2.564133	94	50 - 150	0.0000	+/-0.50	
M3PFHxS	81025.52	3.177667	86,613.00	3.177667	94	50 - 150	0.0000	+/-0.50	
M4PFHpA	564134.4	3.14655	607,093.00	3.138483	93	50 - 150	0.0081	+/-0.50	
M8PFOA	617198.1	3.421167	635,085.00	3.413133	97	50 - 150	0.0080	+/-0.50	
M8PFOS	80196.7	3.60425	89,742.00	3.60425	89	50 - 150	0.0000	+/-0.50	
M9PFNA	506687	3.605283	579,089.00	3.605283	87	50 - 150	0.0000	+/-0.50	
MPFDoA	481127.3	4.048683	598,588.00	4.048683	80	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	137481.1	3.921533	173,520.00	3.91355	79	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	189007.8	3.84175	216,811.00	3.84175	87	50 - 150	0.0000	+/-0.50	
PC-28 (23B0760-11RE1) Lab File ID: 23B0760-11RE1.d Analyzed: 02/15/23 16:25									
M8PFOS	91125.79	3.596267	89,742.00	3.60425	102	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-30 (23B0760-12) Lab File ID: 23B0760-12.d Analyzed: 02/15/23 12:39									
M8FOSA	225726	3.924617	310,268.00	3.924633	73	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	56300.84	2.4886	102,003.00	2.4804	55	50 - 150	0.0082	+/-0.50	
M2PFTA	583268.6	4.297266	791,057.00	4.297283	74	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	91067.34	3.76295	134,679.00	3.762967	68	50 - 150	0.0000	+/-0.50	
MPFBA	294259.4	1.04185	392,126.00	1.04185	75	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	112450.6	2.81475	126,392.00	2.81475	89	50 - 150	0.0000	+/-0.50	
M6PFDA	536854.7	3.763483	633,738.00	3.763483	85	50 - 150	0.0000	+/-0.50	
M3PFBS	105167.2	1.886667	122,987.00	1.8784	86	50 - 150	0.0083	+/-0.50	
M7PFUnA	518878.5	3.914067	640,988.00	3.914067	81	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	45304.31	3.4044	79,262.00	3.4044	57	50 - 150	0.0000	+/-0.50	
M5PFPeA	338426.6	1.706567	385,422.00	1.698283	88	50 - 150	0.0083	+/-0.50	
M5PFHxA	507618	2.572333	568,727.00	2.564133	89	50 - 150	0.0082	+/-0.50	
M3PFHxS	77511.73	3.17765	86,613.00	3.177667	89	50 - 150	0.0000	+/-0.50	
M4PFHpA	546227.3	3.14655	607,093.00	3.138483	90	50 - 150	0.0081	+/-0.50	
M8PFOA	586606.8	3.421167	635,085.00	3.413133	92	50 - 150	0.0080	+/-0.50	
M8PFOS	72578.94	3.60425	89,742.00	3.60425	81	50 - 150	0.0000	+/-0.50	
M9PFNA	490512.6	3.605283	579,089.00	3.605283	85	50 - 150	0.0000	+/-0.50	
MPFDoA	466451.5	4.048683	598,588.00	4.048683	78	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	135539.4	3.913533	173,520.00	3.91355	78	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	176471.7	3.84175	216,811.00	3.84175	81	50 - 150	0.0000	+/-0.50	
PC-30 (23B0760-12RE1) Lab File ID: 23B0760-12RE1.d Analyzed: 02/15/23 16:32									
M8PFOS	93359.52	3.60425	89,742.00	3.60425	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
PC-34S (23B0760-13) Lab File ID: 23B0760-13.d Analyzed: 02/15/23 12:47									
M8FOSA	212545.5	3.924617	310,268.00	3.924633	69	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	58202.1	2.4804	102,003.00	2.4804	57	50 - 150	0.0000	+/-0.50	
M2PFTA	591331.4	4.2892	791,057.00	4.297283	75	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	104255.2	3.76295	134,679.00	3.762967	77	50 - 150	0.0000	+/-0.50	
MPFBA	263904.5	1.04185	392,126.00	1.04185	67	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	106394.2	2.81475	126,392.00	2.81475	84	50 - 150	0.0000	+/-0.50	
M6PFDA	542045.8	3.763467	633,738.00	3.763483	86	50 - 150	0.0000	+/-0.50	
M3PFBS	103922.3	1.878383	122,987.00	1.8784	84	50 - 150	0.0000	+/-0.50	
M7PFUnA	527173.6	3.91405	640,988.00	3.914067	82	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	54782.34	3.4044	79,262.00	3.4044	69	50 - 150	0.0000	+/-0.50	
M5PFPeA	325511.1	1.706567	385,422.00	1.698283	84	50 - 150	0.0083	+/-0.50	
M5PFHxA	495654.3	2.572333	568,727.00	2.564133	87	50 - 150	0.0082	+/-0.50	
M3PFHxS	73268.73	3.17765	86,613.00	3.177667	85	50 - 150	0.0000	+/-0.50	
M4PFHpA	524934.6	3.14655	607,093.00	3.138483	86	50 - 150	0.0081	+/-0.50	
M8PFOA	568281.3	3.413117	635,085.00	3.413133	89	50 - 150	0.0000	+/-0.50	
M8PFOS	69644.67	3.60425	89,742.00	3.60425	78	50 - 150	0.0000	+/-0.50	
M9PFNA	468952.8	3.605283	579,089.00	3.605283	81	50 - 150	0.0000	+/-0.50	
MPFDoA	472570.4	4.048683	598,588.00	4.048683	79	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	137826.8	3.913533	173,520.00	3.91355	79	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	186167.5	3.841733	216,811.00	3.84175	86	50 - 150	0.0000	+/-0.50	
PC-34S (23B0760-13RE1) Lab File ID: 23B0760-13RE1.d Analyzed: 02/15/23 16:40									
M8PFOS	84605.05	3.60425	89,742.00	3.60425	94	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-39 (23B0760-14) Lab File ID: 23B0760-14.d Analyzed: 02/15/23 12:54									
M8FOSA	233842.5	3.932617	310,268.00	3.924633	75	50 - 150	0.0080	+/-0.50	
M2-4:2FTS	51676.06	2.4804	102,003.00	2.4804	51	50 - 150	0.0000	+/-0.50	
M2PFTA	623957.6	4.297283	791,057.00	4.297283	79	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	110613.2	3.762967	134,679.00	3.762967	82	50 - 150	0.0000	+/-0.50	
MPFBA	327188.8	1.04185	392,126.00	1.04185	83	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	132250.8	2.814767	126,392.00	2.81475	105	50 - 150	0.0000	+/-0.50	
M6PFDA	555950.4	3.763483	633,738.00	3.763483	88	50 - 150	0.0000	+/-0.50	
M3PFBS	107183.6	1.886683	122,987.00	1.8784	87	50 - 150	0.0083	+/-0.50	
M7PFUnA	539090	3.914067	640,988.00	3.914067	84	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	50719.86	3.404417	79,262.00	3.4044	64	50 - 150	0.0000	+/-0.50	
M5PFPeA	346125	1.706567	385,422.00	1.698283	90	50 - 150	0.0083	+/-0.50	
M5PFHxA	514377.7	2.57235	568,727.00	2.564133	90	50 - 150	0.0082	+/-0.50	
M3PFHxS	79396.88	3.177667	86,613.00	3.177667	92	50 - 150	0.0000	+/-0.50	
M4PFHpA	553259.8	3.146567	607,093.00	3.138483	91	50 - 150	0.0081	+/-0.50	
M8PFOA	601009.4	3.421183	635,085.00	3.413133	95	50 - 150	0.0080	+/-0.50	
M8PFOS	76893.38	3.60425	89,742.00	3.60425	86	50 - 150	0.0000	+/-0.50	
M9PFNA	524206.5	3.6053	579,089.00	3.605283	91	50 - 150	0.0000	+/-0.50	
MPFDoA	501396.8	4.048683	598,588.00	4.048683	84	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	132981.9	3.92155	173,520.00	3.91355	77	50 - 150	0.0080	+/-0.50	
D3-NMeFOSAA	183676.7	3.84175	216,811.00	3.84175	85	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
Duplicate 1 (23B0760-15) Lab File ID: 23B0760-15.d Analyzed: 02/15/23 13:01									
M8FOSA	249593.3	3.924617	310,268.00	3.924633	80	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	60533.1	2.4804	102,003.00	2.4804	59	50 - 150	0.0000	+/-0.50	
M2PFTA	604799.8	4.297283	791,057.00	4.297283	76	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	111469.6	3.76295	134,679.00	3.762967	83	50 - 150	0.0000	+/-0.50	
MPFBA	319660.8	1.04185	392,126.00	1.04185	82	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	120491.7	2.81475	126,392.00	2.81475	95	50 - 150	0.0000	+/-0.50	
M6PFDA	615164.6	3.763483	633,738.00	3.763483	97	50 - 150	0.0000	+/-0.50	
M3PFBS	116600	1.878383	122,987.00	1.8784	95	50 - 150	0.0000	+/-0.50	
M7PFUnA	588606.3	3.914067	640,988.00	3.914067	92	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	57834.89	3.4044	79,262.00	3.4044	73	50 - 150	0.0000	+/-0.50	
M5PFPeA	363359.3	1.706567	385,422.00	1.698283	94	50 - 150	0.0083	+/-0.50	
M5PFHxA	551492.7	2.57235	568,727.00	2.564133	97	50 - 150	0.0082	+/-0.50	
M3PFHxS	82616.12	3.177667	86,613.00	3.177667	95	50 - 150	0.0000	+/-0.50	
M4PFHpA	581959.4	3.146567	607,093.00	3.138483	96	50 - 150	0.0081	+/-0.50	
M8PFOA	627494.1	3.413133	635,085.00	3.413133	99	50 - 150	0.0000	+/-0.50	
M8PFOS	79924.84	3.60425	89,742.00	3.60425	89	50 - 150	0.0000	+/-0.50	
M9PFNA	556172.6	3.605283	579,089.00	3.605283	96	50 - 150	0.0000	+/-0.50	
MPFDoA	502678.5	4.048683	598,588.00	4.048683	84	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	148990.3	3.913533	173,520.00	3.91355	86	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	200458.3	3.84175	216,811.00	3.84175	92	50 - 150	0.0000	+/-0.50	
Duplicate 1 (23B0760-15RE1) Lab File ID: 23B0760-15RE1.d Analyzed: 02/15/23 16:47									
M8PFOS	87552.24	3.60425	89,742.00	3.60425	98	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
Equipment Blank 1 (23B0760-16)		Lab File ID: 23B0760-16.d				Analyzed: 02/15/23 13:08			
M8FOSA	194181.4	3.924617	310,268.00	3.924633	63	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	66638.74	2.4804	102,003.00	2.4804	65	50 - 150	0.0000	+/-0.50	
M2PFTA	495316.8	4.297283	791,057.00	4.297283	63	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	101553.2	3.76295	134,679.00	3.762967	75	50 - 150	0.0000	+/-0.50	
MPFBA	315445.6	1.04185	392,126.00	1.04185	80	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	105336.9	2.81475	126,392.00	2.81475	83	50 - 150	0.0000	+/-0.50	
M6PFDA	517896.1	3.763467	633,738.00	3.763483	82	50 - 150	0.0000	+/-0.50	
M3PFBS	93791.05	1.886667	122,987.00	1.8784	76	50 - 150	0.0083	+/-0.50	
M7PFUnA	483348.2	3.91405	640,988.00	3.914067	75	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	56499.54	3.4044	79,262.00	3.4044	71	50 - 150	0.0000	+/-0.50	
M5PFPeA	305858.2	1.706567	385,422.00	1.698283	79	50 - 150	0.0083	+/-0.50	
M5PFHxA	461958.7	2.572333	568,727.00	2.564133	81	50 - 150	0.0082	+/-0.50	
M3PFHxS	69563.37	3.17765	86,613.00	3.177667	80	50 - 150	0.0000	+/-0.50	
M4PFHpA	484701.3	3.14655	607,093.00	3.138483	80	50 - 150	0.0081	+/-0.50	
M8PFOA	532986.8	3.413117	635,085.00	3.413133	84	50 - 150	0.0000	+/-0.50	
M8PFOS	74450.21	3.604233	89,742.00	3.60425	83	50 - 150	0.0000	+/-0.50	
M9PFNA	482691.5	3.605283	579,089.00	3.605283	83	50 - 150	0.0000	+/-0.50	
MPFDoA	426308.4	4.048683	598,588.00	4.048683	71	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	113197.6	3.913533	173,520.00	3.91355	65	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	156963	3.841733	216,811.00	3.84175	72	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
Equipment Blank 2 (23B0760-17)		Lab File ID: 23B0760-17.d				Analyzed: 02/15/23 13:16			
M8FOSA	222349.8	3.924633	310,268.00	3.924633	72	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	75003.06	2.4804	102,003.00	2.4804	74	50 - 150	0.0000	+/-0.50	
M2PFTA	568714.1	4.2892	791,057.00	4.297283	72	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	98442.53	3.762967	134,679.00	3.762967	73	50 - 150	0.0000	+/-0.50	
MPFBA	344042.2	1.04185	392,126.00	1.04185	88	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	108830.2	2.81475	126,392.00	2.81475	86	50 - 150	0.0000	+/-0.50	
M6PFDA	548779.4	3.763483	633,738.00	3.763483	87	50 - 150	0.0000	+/-0.50	
M3PFBS	104999.5	1.878383	122,987.00	1.8784	85	50 - 150	0.0000	+/-0.50	
M7PFUnA	533909	3.906083	640,988.00	3.914067	83	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	61768.82	3.4044	79,262.00	3.4044	78	50 - 150	0.0000	+/-0.50	
M5PFPeA	336910.6	1.706567	385,422.00	1.698283	87	50 - 150	0.0083	+/-0.50	
M5PFHxA	498136.2	2.564133	568,727.00	2.564133	88	50 - 150	0.0000	+/-0.50	
M3PFHxS	76544.02	3.177667	86,613.00	3.177667	88	50 - 150	0.0000	+/-0.50	
M4PFHpA	537927.9	3.146567	607,093.00	3.138483	89	50 - 150	0.0081	+/-0.50	
M8PFOA	578151.6	3.413133	635,085.00	3.413133	91	50 - 150	0.0000	+/-0.50	
M8PFOS	69389.48	3.60425	89,742.00	3.60425	77	50 - 150	0.0000	+/-0.50	
M9PFNA	535166.4	3.605283	579,089.00	3.605283	92	50 - 150	0.0000	+/-0.50	
MPFDoA	461078.4	4.048683	598,588.00	4.048683	77	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	130367.8	3.91355	173,520.00	3.91355	75	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	176647.9	3.84175	216,811.00	3.84175	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
Blank (B330940-BLK1)			Lab File ID: B330940-BLK1R.d			Analyzed: 02/15/23 14:57			
M8FOSA	195625.2	3.924633	310,268.00	3.924633	63	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	72413.27	2.480383	102,003.00	2.4804	71	50 - 150	0.0000	+/-0.50	
M2PFTA	499213.3	4.2892	791,057.00	4.289217	63	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	100509.6	3.76295	134,679.00	3.762967	75	50 - 150	0.0000	+/-0.50	
MPFBA	308258.9	1.04185	392,126.00	1.04185	79	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	94235.52	2.81475	126,392.00	2.81475	75	50 - 150	0.0000	+/-0.50	
M6PFDA	479505.3	3.763483	633,738.00	3.763483	76	50 - 150	0.0000	+/-0.50	
M3PFBS	97082.93	1.878383	122,987.00	1.8784	79	50 - 150	0.0000	+/-0.50	
M7PFUnA	465039.7	3.906083	640,988.00	3.906083	73	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	58637.64	3.4044	79,262.00	3.4044	74	50 - 150	0.0000	+/-0.50	
M5PFPeA	312455.8	1.706567	385,422.00	1.698283	81	50 - 150	0.0083	+/-0.50	
M5PFHxA	459076.2	2.564117	568,727.00	2.564133	81	50 - 150	0.0000	+/-0.50	
M3PFHxS	70728.77	3.17765	86,613.00	3.177667	82	50 - 150	0.0000	+/-0.50	
M4PFHpA	498548.4	3.138483	607,093.00	3.138483	82	50 - 150	0.0000	+/-0.50	
M8PFOA	535900.4	3.413117	635,085.00	3.413133	84	50 - 150	0.0000	+/-0.50	
M8PFOS	69959.23	3.60425	89,742.00	3.60425	78	50 - 150	0.0000	+/-0.50	
M9PFNA	466526.2	3.605283	579,089.00	3.605283	81	50 - 150	0.0000	+/-0.50	
MPFDoA	407457.2	4.048683	598,588.00	4.0487	68	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	113007	3.91355	173,520.00	3.91355	65	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	160338.7	3.8338	216,811.00	3.841767	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
LCS (B330940-BS1)			Lab File ID: B330940-BS1R.d			Analyzed: 02/15/23 14:49			
M8FOSA	223525.3	3.924617	310,268.00	3.924633	72	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	83456.48	2.4804	102,003.00	2.4804	82	50 - 150	0.0000	+/-0.50	
M2PFTA	579720.9	4.2892	791,057.00	4.289217	73	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	115572.3	3.76295	134,679.00	3.762967	86	50 - 150	0.0000	+/-0.50	
MPFBA	336577.3	1.04185	392,126.00	1.04185	86	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	118796.3	2.81475	126,392.00	2.81475	94	50 - 150	0.0000	+/-0.50	
M6PFDA	558603.1	3.763483	633,738.00	3.763483	88	50 - 150	0.0000	+/-0.50	
M3PFBS	108945.9	1.878383	122,987.00	1.8784	89	50 - 150	0.0000	+/-0.50	
M7PFUnA	537345.9	3.906067	640,988.00	3.906083	84	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	62596.05	3.4044	79,262.00	3.4044	79	50 - 150	0.0000	+/-0.50	
M5PFPeA	343909.5	1.706567	385,422.00	1.698283	89	50 - 150	0.0083	+/-0.50	
M5PFHxA	511867.7	2.572333	568,727.00	2.564133	90	50 - 150	0.0082	+/-0.50	
M3PFHxS	78734.04	3.177667	86,613.00	3.177667	91	50 - 150	0.0000	+/-0.50	
M4PFHpA	540923.8	3.14655	607,093.00	3.138483	89	50 - 150	0.0081	+/-0.50	
M8PFOA	580448.8	3.413133	635,085.00	3.413133	91	50 - 150	0.0000	+/-0.50	
M8PFOS	80391.08	3.60425	89,742.00	3.60425	90	50 - 150	0.0000	+/-0.50	
M9PFNA	530793	3.605283	579,089.00	3.605283	92	50 - 150	0.0000	+/-0.50	
MPFDoA	472907.2	4.048683	598,588.00	4.0487	79	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	133364.4	3.913533	173,520.00	3.91355	77	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	182528.9	3.84175	216,811.00	3.841767	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
Matrix Spike (B330940-MS1)			Lab File ID: B330940-MS1.d			Analyzed: 02/15/23 10:50			
M8FOSA	245095.8	3.924633	310,268.00	3.924617	79	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	74281.18	2.4886	102,003.00	2.4804	73	50 - 150	0.0082	+/-0.50	
M2PFTA	602893.7	4.297283	791,057.00	4.297266	76	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	140145.1	3.762967	134,679.00	3.76295	104	50 - 150	0.0000	+/-0.50	
MPFBA	321199.4	1.04185	392,126.00	1.04185	82	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	109126.4	2.81475	126,392.00	2.81475	86	50 - 150	0.0000	+/-0.50	
M6PFDA	556017.9	3.763483	633,738.00	3.763467	88	50 - 150	0.0000	+/-0.50	
M3PFBS	110266.2	1.886667	122,987.00	1.878383	90	50 - 150	0.0083	+/-0.50	
M7PFUnA	583004.1	3.914067	640,988.00	3.914067	91	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	65360.77	3.4044	79,262.00	3.4044	82	50 - 150	0.0000	+/-0.50	
M5PFPeA	343235.5	1.706567	385,422.00	1.706567	89	50 - 150	0.0000	+/-0.50	
M5PFHxA	508563.4	2.572333	568,727.00	2.564117	89	50 - 150	0.0082	+/-0.50	
M3PFHxS	76600.45	3.177667	86,613.00	3.17765	88	50 - 150	0.0000	+/-0.50	
M4PFHpA	549773.6	3.14655	607,093.00	3.138483	91	50 - 150	0.0081	+/-0.50	
M8PFOA	588655.8	3.421183	635,085.00	3.413117	93	50 - 150	0.0081	+/-0.50	
M8PFOS	54018.92	3.60425	89,742.00	3.60425	60	50 - 150	0.0000	+/-0.50	
M9PFNA	349259.2	3.605283	579,089.00	3.605283	60	50 - 150	0.0000	+/-0.50	
MPFDoA	513894.4	4.048683	598,588.00	4.048683	86	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	151511.5	3.921533	173,520.00	3.921533	87	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	200443.9	3.84175	216,811.00	3.84175	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
Matrix Spike Dup (B330940-MSD1)			Lab File ID: B330940-MSD1.d			Analyzed: 02/15/23 10:57			
M8FOSA	250407	3.924633	310,268.00	3.924617	81	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	70340.12	2.4886	102,003.00	2.4804	69	50 - 150	0.0082	+/-0.50	
M2PFTA	617077.1	4.297283	791,057.00	4.297266	78	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	155679.2	3.762967	134,679.00	3.76295	116	50 - 150	0.0000	+/-0.50	
MPFBA	335663.5	1.04185	392,126.00	1.04185	86	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	101356.6	2.822933	126,392.00	2.81475	80	50 - 150	0.0082	+/-0.50	
M6PFDA	573740	3.763483	633,738.00	3.763467	91	50 - 150	0.0000	+/-0.50	
M3PFBS	107988.5	1.886667	122,987.00	1.878383	88	50 - 150	0.0083	+/-0.50	
M7PFUnA	545843.4	3.914067	640,988.00	3.914067	85	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	63254	3.4044	79,262.00	3.4044	80	50 - 150	0.0000	+/-0.50	
M5PFPeA	350773.3	1.706567	385,422.00	1.706567	91	50 - 150	0.0000	+/-0.50	
M5PFHxA	523840.1	2.572333	568,727.00	2.564117	92	50 - 150	0.0082	+/-0.50	
M3PFHxS	74873.8	3.17765	86,613.00	3.17765	86	50 - 150	0.0000	+/-0.50	
M4PFHpA	551009.9	3.14655	607,093.00	3.138483	91	50 - 150	0.0081	+/-0.50	
M8PFOA	597971.3	3.421183	635,085.00	3.413117	94	50 - 150	0.0081	+/-0.50	
M8PFOS	54884.63	3.60425	89,742.00	3.60425	61	50 - 150	0.0000	+/-0.50	
M9PFNA	363801.9	3.613267	579,089.00	3.605283	63	50 - 150	0.0080	+/-0.50	
MPFDoA	522144.4	4.048683	598,588.00	4.048683	87	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	139193.1	3.921533	173,520.00	3.921533	80	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	199017.6	3.84175	216,811.00	3.84175	92	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
Perfluorobutanesulfonic acid (PFBS)	NH-P
Perfluoropentanoic acid (PFPeA)	NH-P
Perfluorohexanoic acid (PFHxA)	NH-P
11Cl-PF3OUdS (F53B Major)	NH-P
9Cl-PF3ONS (F53B Minor)	NH-P
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P
Perfluorodecanoic acid (PFDA)	NH-P
Perfluorododecanoic acid (PFDoA)	NH-P
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P
Perfluoroheptanesulfonic acid (PFHpS)	NH-P
N-EtFOSAA (NEtFOSAA)	NH-P
N-MeFOSAA (NMeFOSAA)	NH-P
Perfluorotetradecanoic acid (PFTA)	NH-P
Perfluorotridecanoic acid (PFTrDA)	NH-P
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P
Perfluorodecanesulfonic acid (PFDS)	NH-P
Perfluorooctanesulfonamide (FOSA)	NH-P
Perfluorononanesulfonic acid (PFNS)	NH-P
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P
Perfluoro-1-butanesulfonamide (FBSA)	NH-P
Perfluorohexanesulfonic acid (PFHxS)	NH-P
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P
Perfluoropetanesulfonic acid (PFPeS)	NH-P
Perfluoroundecanoic acid (PFUnA)	NH-P
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P
Perfluoroheptanoic acid (PFHpA)	NH-P
Perfluorooctanoic acid (PFOA)	NH-P
Perfluorooctanesulfonic acid (PFOS)	NH-P
Perfluorononanoic acid (PFNA)	NH-P

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

Historic Laboratory Results for Quarterly Sampling 2023

Please note- these results are historic results provided by Pace or another accredited laboratory, these results are for informational purposes only and do not reflect actual results of what may be in Jan/Feb 2023 sample

SAMPLE ID	PFW-1	PFW-2	PFW-5	OW-8A	MW-3S	MW-12S	MW-22	PC-1	PC-6A	PC-16D	PC-28	PC-30	PC-34S	PC-39
SAMPLING DATE	11/9/2022	11/9/2022	11/9/2022	11/9/2022	11/3/2021	1/25/2022	7/28/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/10/2022	11/9/2022	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
PFAS														
PFOA	7,100	1,900	2,700	76	1,400	950	480	850	470	1,700	960	340	1,300	160
PFOA	500	110	24	13	360	100	77.0	230	30	89	56	21	80	2.2
PFNA	170	86	5.5	BRL (<1.9)	36	27	8.7	61	47	59	82	43	140	5.2
PFHxS	2,000	310	500	70	1,800	390	370	960	72	360	130	59	130	12
PFHpA	330	180	20.0	10	210	63	20	550	47	71	75	29	98	4
PFDA	42	27.0	7.8	BRL (<1.9)	BRL (<3.9)	4.7	<3.9	23.0	12	11.0	15.0	5.3	16.0	BRL (<1.8)
TOTAL Σ6 PFAS	10,142	2,613	3,257	169	3,806	1,535	956	2,674	678	2,290	1,318.0	497	1,764	183.4
Comments	MS/MSD submitted			April 2022 PFAS6 sum was over 2,000 ng/L					April 2022 PFAS6 sum was over 1,000 ng/L					

ENV-FRM-ELON-0001 v02__Sample Receiving Checklist 1-12-2023

May 12, 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: 23D0977

Enclosed are results of analyses for samples as received by the laboratory on April 7, 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

51

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

REPORT DATE: 5/12/2023

PURCHASE ORDER NUMBER: 23000936

PROJECT NUMBER: 6206

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 23D0977

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-39	23D0977-01	Ground Water		SOP-454 PFAS	
PFW-1	23D0977-02	Ground Water		SOP-454 PFAS	
PFW-5	23D0977-03	Ground Water		SOP-454 PFAS	
PC-28	23D0977-04	Ground Water		SOP-454 PFAS	
OW-8A	23D0977-05	Ground Water		SOP-454 PFAS	
PFW-2	23D0977-06	Ground Water		SOP-454 PFAS	
EB-4.4.23	23D0977-07	Ground Water		SOP-454 PFAS	
EB-4.5.23	23D0977-08	Ground Water		SOP-454 PFAS	
MW-12S	23D0977-09	Ground Water		SOP-454 PFAS	
MW-22	23D0977-10	Ground Water		SOP-454 PFAS	
PC-16D	23D0977-11	Ground Water		SOP-454 PFAS	
PC-30	23D0977-12	Ground Water		SOP-454 PFAS	
PC-1	23D0977-13	Ground Water		SOP-454 PFAS	
PC-6A	23D0977-14	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:

D-01

Sample extracted/prepared at a dilution due to sample matrix interference.

Analyte & Samples(s) Qualified:

23D0977-01RE1[PC-39], 23D0977-02RE1[PFW-1], 23D0977-03RE1[PFW-5], 23D0977-04RE1[PC-28], 23D0977-05RE1[OW-8A], 23D0977-06RE1[PFW-2], 23D0977-09[MW-12S], 23D0977-11[PC-16D], 23D0977-13RE1[PC-1], 23D0977-14[PC-6A]

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:

Perfluorooctanesulfonic acid (PFOS)

B336788-MS1, B336788-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:

Perfluorobutanoic acid (PFBA)

B336788-MS1, B336788-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)

B336788-MS1

Perfluorohexanoic acid (PFHxA)

B336788-MS1

Perfluorononanesulfonic acid (PFNS)

B336788-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:

M2-6:2FTS

23D0977-06RE1[PFW-2], 23D0977-13RE1[PC-1]

M2-8:2FTS

23D0977-01RE1[PC-39], 23D0977-02RE1[PFW-1], 23D0977-06RE1[PFW-2], 23D0977-07[EB-4.4.23], 23D0977-08[EB-4.5.23], 23D0977-10[MW-22], B338660-BLK1

PF-18

Duplicate analysis confirmed Extracted Internal Standard failure due to matrix effects.

Analyte & Samples(s) Qualified:

M2-6:2FTS

23D0977-05RE1[OW-8A]

M2-8:2FTS

23D0977-05RE1[OW-8A], B336788-MS1, B336788-MSD1

M8FOSA

B336788-MS1, B336788-MSD1

M8PFOS

23D0977-02RE1[PFW-1]

M9PFNA

23D0977-02RE1[PFW-1]

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)**

23D0977-06RE5[PFW-2], 23D0977-13RE3[PC-1]

8:2 Fluorotelomersulfonic acid (8:2FTS A)

23D0977-06RE4[PFW-2]

M2-6:2FTS

23D0977-06RE5[PFW-2]

Perfluoro-1-butanesulfonamide (FBSA)

23D0977-06RE4[PFW-2]

Perfluoro-1-hexanesulfonamide (FHxSA)

23D0977-02RE2[PFW-1], 23D0977-06RE4[PFW-2]

Perfluoroheptanesulfonic acid (PFHpS)

23D0977-02RE2[PFW-1]

Perfluoroheptanoic acid (PFHpA)

23D0977-06RE4[PFW-2]

Perfluorohexanesulfonic acid (PFHxS)

23D0977-02RE2[PFW-1], 23D0977-03RE3[PFW-5], 23D0977-05RE3[OW-8A], 23D0977-06RE4[PFW-2], 23D0977-09RE1[MW-12S], 23D0977-11RE1[PC-16D],

23D0977-13RE3[PC-1]

Perfluorohexanoic acid (PFHxA)

23D0977-06RE4[PFW-2]

Perfluorooctanesulfonic acid (PFOS)

23D0977-02RE5[PFW-1], 23D0977-03RE3[PFW-5], 23D0977-04RE3[PC-28], 23D0977-05RE3[OW-8A], 23D0977-06RE4[PFW-2], 23D0977-09RE1[MW-12S],

23D0977-11RE1[PC-16D], 23D0977-13RE3[PC-1], 23D0977-14RE1[PC-6A]

Perfluorooctanoic acid (PFOA)

23D0977-06RE4[PFW-2]

Perfluoropentanoic acid (PFPeA)

23D0977-06RE4[PFW-2]

Perfluoroundecanoic acid (PFUnA)

23D0977-06RE4[PFW-2]

S-29

Extracted Internal Standard is outside of control limits.

Analyte & Samples(s) Qualified:**M2-4:2FTS**

23D0977-05RE1[OW-8A]

M2-6:2FTS

S087029-CCV4

M2-8:2FTS

23D0977-03RE1[PFW-5], 23D0977-04RE1[PC-28], 23D0977-09[MW-12S], 23D0977-11[PC-16D], 23D0977-12[PC-30], 23D0977-14[PC-6A], B336788-BS1, B338660-BS1

M2PFTA

23D0977-10[MW-22], B336788-MSD1

M3HFPO-DA

S087029-CCV4

M3PFHxS

S087029-CCV3, S087029-CCV4

M4PFHpA

S087029-CCV3, S087029-CCV4

M8PFOA

S087029-CCV3, S087029-CCV4, S087277-CCV3

V-05

Continuing calibration verification (CCV) did not meet method specifications and was biased on the low side for this compound.

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

S087029-CCV2

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:**N-EtFOSAA (NEtFOSAA)**

S087343-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: 23D0977

Date Received: 4/7/2023

Field Sample #: PC-39

Sampled: 4/4/2023 10:30

Sample ID: 23D0977-01

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)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluoropentanoic acid (PFPeA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorohexanoic acid (PFHxA)	5.2	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorodecanoic acid (PFDA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorododecanoic acid (PFDoA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluoroheptanesulfonic acid (PFHpS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
N-EtFOSAA (NEtFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
N-MeFOSAA (NMeFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorotetradecanoic acid (PFTA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorooctanesulfonamide (FOSA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorononanesulfonic acid (PFNS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluoro-1-butanefulfonamide (FBFA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorohexanesulfonic acid (PFHxS)	9.2	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	6.2	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluoropentanesulfonic acid (PFPeS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluoroundecanoic acid (PFUnA)	6.3	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluoroheptanoic acid (PFHpA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorooctanoic acid (PFOA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorooctanesulfonic acid (PFOS)	96	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW
Perfluorononanoic acid (PFNA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:45	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: PFW-1

Sampled: 4/4/2023 13:30

Sample ID: 23D0977-02

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)	58	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorobutanesulfonic acid (PFBS)	25	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluoropentanoic acid (PFPeA)	200	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorohexanoic acid (PFHxA)	240	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
11Cl-PF3OUdS (F53B Major)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
9Cl-PF3ONS (F53B Minor)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorodecanoic acid (PFDA)	79	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorododecanoic acid (PFDoA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluoroheptanesulfonic acid (PFHpS)	130	83	ng/L	20	PF-19	SOP-454 PFAS	5/1/23	5/11/23 2:42	QNW
N-EtFOSAA (NEtFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
N-MeFOSAA (NMeFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorotetradecanoic acid (PFTA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorodecanesulfonic acid (PFDS)	7.7	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorooctanesulfonamide (FOSA)	17	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorononanesulfonic acid (PFNS)	200	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	1600	83	ng/L	20	PF-19	SOP-454 PFAS	5/1/23	5/11/23 2:42	QNW
Perfluoro-1-butanefulfonamide (FBFA)	65	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorohexanesulfonic acid (PFHxS)	910	83	ng/L	20	PF-19	SOP-454 PFAS	5/1/23	5/11/23 2:42	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	280	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluoropentanesulfonic acid (PFPeS)	83	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluoroundecanoic acid (PFUnA)	42	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluoroheptanoic acid (PFHpA)	160	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorooctanoic acid (PFOA)	200	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW
Perfluorooctanesulfonic acid (PFOS)	15000	420	ng/L	100	PF-19	SOP-454 PFAS	5/1/23	5/11/23 2:50	QNW
Perfluorononanoic acid (PFNA)	150	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:52	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: PFW-5

Sampled: 4/4/2023 12:30

Sample ID: 23D0977-03

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)	65	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorobutanesulfonic acid (PFBS)	56	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluoropentanoic acid (PFPeA)	210	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorohexanoic acid (PFHxA)	240	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	29	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorodecanoic acid (PFDA)	5.1	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorododecanoic acid (PFDoA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluoroheptanesulfonic acid (PFHpS)	26	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
N-EtFOSAA (NEtFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
N-MeFOSAA (NMeFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorotetradecanoic acid (PFTA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorooctanesulfonamide (FOSA)	44	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorononanesulfonic acid (PFNS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	73	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluoro-1-butanefulfonamide (FBFA)	51	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorohexanesulfonic acid (PFHxS)	670	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 2:57	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	47	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluoropentanesulfonic acid (PFPeS)	81	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluoroundecanoic acid (PFUnA)	13	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Nonfluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluoroheptanoic acid (PFHpA)	100	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorooctanoic acid (PFOA)	110	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW
Perfluorooctanesulfonic acid (PFOS)	660	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 2:57	QNW
Perfluorononanoic acid (PFNA)	55	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/9/23 23:59	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: PC-28

Sampled: 4/4/2023 09:00

Sample ID: 23D0977-04

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	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorobutanesulfonic acid (PFBS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluoropentanoic acid (PFPeA)	47	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorohexanoic acid (PFHxA)	52	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	5.4	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorodecanoic acid (PFDA)	10	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorododecanoic acid (PFDoA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluoroheptanesulfonic acid (PFHpS)	6.8	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
N-EtFOSAA (NEtFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
N-MeFOSAA (NMeFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorotetradecanoic acid (PFTA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorooctanesulfonamide (FOSA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorononanesulfonic acid (PFNS)	6.0	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	25	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluoro-1-butanefulfonamide (FBFA)	5.8	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorohexanesulfonic acid (PFHxS)	76	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	11	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluoropentanesulfonic acid (PFPeS)	6.6	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluoroundecanoic acid (PFUnA)	50	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluoroheptanoic acid (PFHpA)	44	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorooctanoic acid (PFOA)	29	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW
Perfluorooctanesulfonic acid (PFOS)	600	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:04	QNW
Perfluorononanoic acid (PFNA)	46	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:06	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: OW-8A

Sampled: 4/4/2023 13:00

Sample ID: 23D0977-05

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)	65	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorobutanesulfonic acid (PFBS)	36	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluoropentanoic acid (PFPeA)	210	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorohexanoic acid (PFHxA)	300	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
11Cl-PF3OUdS (F53B Major)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
9Cl-PF3ONS (F53B Minor)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	71	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorodecanoic acid (PFDA)	4.6	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorododecanoic acid (PFDoA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluoroheptanesulfonic acid (PFHpS)	14	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
N-EtFOSAA (NEtFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
N-MeFOSAA (NMeFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorotetradecanoic acid (PFTA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorooctanesulfonamide (FOSA)	20	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorononanesulfonic acid (PFNS)	5.0	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	47	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluoro-1-butanefulfonamide (FBFA)	11	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorohexanesulfonic acid (PFHxS)	660	42	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:11	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	12	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluoropentanesulfonic acid (PFPeS)	36	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluoroundecanoic acid (PFUnA)	21	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluoroheptanoic acid (PFHpA)	140	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorooctanoic acid (PFOA)	210	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW
Perfluorooctanesulfonic acid (PFOS)	680	42	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:11	QNW
Perfluorononanoic acid (PFNA)	25	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:13	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: PFW-2

Sampled: 4/4/2023 13:50

Sample ID: 23D0977-06

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)	340	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluorobutanesulfonic acid (PFBS)	70	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluoropentanoic acid (PFPeA)	870	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:18	QNW
Perfluorohexanoic acid (PFHxA)	1100	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:18	QNW
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	310	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:18	QNW
Perfluorodecanoic acid (PFDA)	11	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluorododecanoic acid (PFDoA)	6.2	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluoroheptanesulfonic acid (PFHpS)	43	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
N-EtFOSAA (NEtFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
N-MeFOSAA (NMeFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluorotetradecanoic acid (PFTA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	30	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluorodecanesulfonic acid (PFDS)	20	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluorooctanesulfonamide (FOSA)	20	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluorononanesulfonic acid (PFNS)	14	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	560	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:18	QNW
Perfluoro-1-butanefulfonamide (FBFA)	350	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:18	QNW
Perfluorohexanesulfonic acid (PFHxS)	1000	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:18	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	6000	410	ng/L	100	PF-19	SOP-454 PFAS	5/1/23	5/12/23 12:52	QNW
Perfluoropentanesulfonic acid (PFPeS)	130	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluoroundecanoic acid (PFUnA)	320	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:18	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW
Perfluoroheptanoic acid (PFHpA)	320	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:18	QNW
Perfluorooctanoic acid (PFOA)	730	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:18	QNW
Perfluorooctanesulfonic acid (PFOS)	1100	41	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:18	QNW
Perfluorononanoic acid (PFNA)	160	4.1	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:21	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: EB-4.4.23

Sampled: 4/4/2023 14:00

Sample ID: 23D0977-07

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	4/17/23	4/27/23 16:10	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:10	AMS

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: EB-4.5.23

Sampled: 4/5/2023 14:00

Sample ID: 23D0977-08

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)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluoropentanoic acid (PFPeA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorohexanoic acid (PFHxA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
11Cl-PF3OUdS (F53B Major)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
9Cl-PF3ONS (F53B Minor)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorodecanoic acid (PFDA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorododecanoic acid (PFDoA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
N-EtFOSAA (NEtFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
N-MeFOSAA (NMeFOSAA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorotetradecanoic acid (PFTA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorotridecanoic acid (PFTTrDA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorooctanesulfonamide (FOSA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorononanesulfonic acid (PFNS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorohexanesulfonic acid (PFHxS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluoropentanesulfonic acid (PFPeS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluoroundecanoic acid (PFUnA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluoroheptanoic acid (PFHpA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorooctanoic acid (PFOA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorooctanesulfonic acid (PFOS)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS
Perfluorononanoic acid (PFNA)	ND	1.9	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:17	AMS

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: MW-12S

Sampled: 4/5/2023 12:50

Sample ID: 23D0977-09

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)	44	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorobutanesulfonic acid (PFBS)	11	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluoropentanoic acid (PFPeA)	150	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorohexanoic acid (PFHxA)	130	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorodecanoic acid (PFDA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorododecanoic acid (PFDoA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluoroheptanesulfonic acid (PFHpS)	13	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
N-EtFOSAA (NEtFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
N-MeFOSAA (NMeFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorotetradecanoic acid (PFTA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorooctanesulfonamide (FOSA)	370	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorononanesulfonic acid (PFNS)	4.5	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	69	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluoro-1-butanefulfonamide (FBFA)	20	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorohexanesulfonic acid (PFHxS)	400	41	ng/L	10	PF-19	SOP-454 PFAS	4/17/23	5/2/23 9:15	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	26	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluoropentanesulfonic acid (PFPeS)	17	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluoroundecanoic acid (PFUnA)	17	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluoroheptanoic acid (PFHpA)	71	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorooctanoic acid (PFOA)	150	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS
Perfluorooctanesulfonic acid (PFOS)	630	41	ng/L	10	PF-19	SOP-454 PFAS	4/17/23	5/2/23 9:15	QNW
Perfluorononanoic acid (PFNA)	14	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:25	AMS

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: MW-22

Sampled: 4/5/2023 12:55

Sample ID: 23D0977-10

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	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluoropentanoic acid (PFPeA)	2.1	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorohexanoic acid (PFHxA)	2.7	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
11Cl-PF3OUdS (F53B Major)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
9Cl-PF3ONS (F53B Minor)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorodecanoic acid (PFDA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorododecanoic acid (PFDoA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluoroheptanesulfonic acid (PFHpS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
N-EtFOSAA (NEtFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
N-MeFOSAA (NMeFOSAA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorotetradecanoic acid (PFTA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorooctanesulfonamide (FOSA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorononanesulfonic acid (PFNS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluoro-1-butanefulfonamide (FBFA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorohexanesulfonic acid (PFHxS)	23	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluoropentanesulfonic acid (PFPeS)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluoroundecanoic acid (PFUnA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluoroheptanoic acid (PFHpA)	2.0	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorooctanoic acid (PFOA)	7.1	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorooctanesulfonic acid (PFOS)	86	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS
Perfluorononanoic acid (PFNA)	ND	1.8	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:32	AMS

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: PC-16D

Sampled: 4/5/2023 08:30

Sample ID: 23D0977-11

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)	92	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorobutanesulfonic acid (PFBS)	40	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluoropentanoic acid (PFPeA)	280	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorohexanoic acid (PFHxA)	250	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	19	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorodecanoic acid (PFDA)	8.2	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorododecanoic acid (PFDoA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluoroheptanesulfonic acid (PFHpS)	46	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
N-EtFOSAA (NEtFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
N-MeFOSAA (NMeFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorotetradecanoic acid (PFTA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorooctanesulfonamide (FOSA)	13	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorononanesulfonic acid (PFNS)	8.0	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	62	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluoro-1-butanefulfonamide (FBFA)	50	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorohexanesulfonic acid (PFHxS)	490	41	ng/L	10	PF-19	SOP-454 PFAS	4/17/23	5/2/23 9:23	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	160	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluoropentanesulfonic acid (PFPeS)	63	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluoroundecanoic acid (PFUnA)	16	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluoroheptanoic acid (PFHpA)	110	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorooctanoic acid (PFOA)	120	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS
Perfluorooctanesulfonic acid (PFOS)	1300	41	ng/L	10	PF-19	SOP-454 PFAS	4/17/23	5/2/23 9:23	QNW
Perfluorononanoic acid (PFNA)	72	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:39	AMS

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: PC-30

Sampled: 4/5/2023 07:30

Sample ID: 23D0977-12

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)	21	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorobutanesulfonic acid (PFBS)	7.6	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluoropentanoic acid (PFPeA)	57	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorohexanoic acid (PFHxA)	66	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
11Cl-PF3OUdS (F53B Major)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
9Cl-PF3ONS (F53B Minor)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.0	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorodecanoic acid (PFDA)	10	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorododecanoic acid (PFDoA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluoroheptanesulfonic acid (PFHpS)	9.4	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
N-EtFOSAA (NEtFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
N-MeFOSAA (NMeFOSAA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorotetradecanoic acid (PFTA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorooctanesulfonamide (FOSA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorononanesulfonic acid (PFNS)	4.6	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	24	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluoro-1-butanefulfonamide (FBFA)	9.5	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorohexanesulfonic acid (PFHxS)	96	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	18	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluoropentanesulfonic acid (PFPeS)	9.9	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluoroundecanoic acid (PFUnA)	18	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluoroheptanoic acid (PFHpA)	45	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorooctanoic acid (PFOA)	35	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS
Perfluorooctanesulfonic acid (PFOS)	580	41	ng/L	10		SOP-454 PFAS	4/17/23	5/2/23 9:30	QNW
Perfluorononanoic acid (PFNA)	65	4.1	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 16:46	AMS

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: PC-1

Sampled: 4/5/2023 10:30

Sample ID: 23D0977-13

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)	93	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorobutanesulfonic acid (PFBS)	19	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluoropentanoic acid (PFPeA)	340	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorohexanoic acid (PFHxA)	270	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
11Cl-PF3OUdS (F53B Major)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
9Cl-PF3ONS (F53B Minor)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
8:2 Fluorotelomersulfonic acid (8:2FTS A)	61	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorodecanoic acid (PFDA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorododecanoic acid (PFDoA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluoroheptanesulfonic acid (PFHpS)	13	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
N-EtFOSAA (NEtFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
N-MeFOSAA (NMeFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorotetradecanoic acid (PFTA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorotridecanoic acid (PFTTrDA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorodecanesulfonic acid (PFDS)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorooctanesulfonamide (FOSA)	5.3	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorononanesulfonic acid (PFNS)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluoro-1-hexanesulfonamide (FHxSA)	100	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluoro-1-butanefulfonamide (FBFA)	72	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorohexanesulfonic acid (PFHxS)	540	42	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:26	QNW
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
6:2 Fluorotelomersulfonic acid (6:2FTS A)	560	42	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:26	QNW
Perfluoropentanesulfonic acid (PFPeS)	33	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluoroundecanoic acid (PFUnA)	34	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluoroheptanoic acid (PFHpA)	160	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorooctanoic acid (PFOA)	250	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW
Perfluorooctanesulfonic acid (PFOS)	510	42	ng/L	10	PF-19	SOP-454 PFAS	5/1/23	5/11/23 3:26	QNW
Perfluorononanoic acid (PFNA)	27	4.2	ng/L	1		SOP-454 PFAS	5/1/23	5/10/23 0:28	QNW

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

Project Location: Barnstable, MA

Sample Description:

Work Order: 23D0977

Date Received: 4/7/2023

Field Sample #: PC-6A

Sampled: 4/5/2023 09:30

Sample ID: 23D0977-14

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)	17	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorobutanesulfonic acid (PFBS)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluoropentanoic acid (PFPeA)	40	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorohexanoic acid (PFHxA)	43	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
11Cl-PF3OUdS (F53B Major)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
9Cl-PF3ONS (F53B Minor)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
4,8-Dioxo-3H-perfluorononanoic acid (ADONA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
8:2 Fluorotelomersulfonic acid (8:2FTS A)	5.7	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorodecanoic acid (PFDA)	9.3	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorododecanoic acid (PFDoA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluoroheptanesulfonic acid (PFHpS)	4.8	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
N-EtFOSAA (NEtFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
N-MeFOSAA (NMeFOSAA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorotetradecanoic acid (PFTA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorotridecanoic acid (PFTrDA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
4:2 Fluorotelomersulfonic acid (4:2FTS A)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorodecanesulfonic acid (PFDS)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorooctanesulfonamide (FOSA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorononanesulfonic acid (PFNS)	5.3	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluoro-1-hexanesulfonamide (FHxSA)	18	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluoro-1-butanefulfonamide (FBFA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorohexanesulfonic acid (PFHxS)	65	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluoro-4-oxapentanoic acid (PFMPA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluoro-5-oxahexanoic acid (PFMBA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
6:2 Fluorotelomersulfonic acid (6:2FTS A)	7.7	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluoropentanesulfonic acid (PFPeS)	5.4	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluoroundecanoic acid (PFUnA)	71	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ND	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluoroheptanoic acid (PFHpA)	36	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorooctanoic acid (PFOA)	27	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS
Perfluorooctanesulfonic acid (PFOS)	390	42	ng/L	10	PF-19	SOP-454 PFAS	4/17/23	5/2/23 9:59	QNW
Perfluorononanoic acid (PFNA)	45	4.2	ng/L	1		SOP-454 PFAS	4/17/23	4/27/23 17:01	AMS

Sample Extraction Data

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23D0977-07 [EB-4.4.23]	B336788	269	1.00	04/17/23
23D0977-08 [EB-4.5.23]	B336788	267	1.00	04/17/23
23D0977-09 [MW-12S]	B336788	123	1.00	04/17/23
23D0977-09RE1 [MW-12S]	B336788	123	1.00	04/17/23
23D0977-10 [MW-22]	B336788	276	1.00	04/17/23
23D0977-11 [PC-16D]	B336788	121	1.00	04/17/23
23D0977-11RE1 [PC-16D]	B336788	121	1.00	04/17/23
23D0977-12 [PC-30]	B336788	122	1.00	04/17/23
23D0977-12RE1 [PC-30]	B336788	122	1.00	04/17/23
23D0977-14 [PC-6A]	B336788	120	1.00	04/17/23
23D0977-14RE1 [PC-6A]	B336788	120	1.00	04/17/23

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

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
23D0977-01RE1 [PC-39]	B338660	122	1.00	05/01/23
23D0977-02RE1 [PFW-1]	B338660	120	1.00	05/01/23
23D0977-02RE2 [PFW-1]	B338660	120	1.00	05/01/23
23D0977-02RE5 [PFW-1]	B338660	120	1.00	05/01/23
23D0977-03RE1 [PFW-5]	B338660	121	1.00	05/01/23
23D0977-03RE3 [PFW-5]	B338660	121	1.00	05/01/23
23D0977-04RE1 [PC-28]	B338660	121	1.00	05/01/23
23D0977-04RE3 [PC-28]	B338660	121	1.00	05/01/23
23D0977-05RE1 [OW-8A]	B338660	120	1.00	05/01/23
23D0977-05RE3 [OW-8A]	B338660	120	1.00	05/01/23
23D0977-06RE1 [PFW-2]	B338660	121	1.00	05/01/23
23D0977-06RE4 [PFW-2]	B338660	121	1.00	05/01/23
23D0977-06RE5 [PFW-2]	B338660	121	1.00	05/01/23
23D0977-13RE1 [PC-1]	B338660	120	1.00	05/01/23
23D0977-13RE3 [PC-1]	B338660	120	1.00	05/01/23

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

Batch B336788 - SOP 454-PFAAS
Blank (B336788-BLK1)

Prepared: 04/17/23 Analyzed: 04/27/23

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 (PFEESA)	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 (B336788-BS1)

Prepared: 04/17/23 Analyzed: 04/27/23

Perfluorobutanoic acid (PFBA)	11.4	1.8	ng/L	9.23	124	73-129
Perfluorobutanesulfonic acid (PFBS)	9.72	1.8	ng/L	8.17	119	72-130
Perfluoropentanoic acid (PFPeA)	11.0	1.8	ng/L	9.23	119	72-129
Perfluorohexanoic acid (PFHxA)	11.2	1.8	ng/L	9.23	122	72-129
11Cl-PF3OUdS (F53B Major)	7.79	1.8	ng/L	8.69	89.6	55.1-141
9Cl-PF3ONS (F53B Minor)	8.97	1.8	ng/L	8.60	104	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.86	1.8	ng/L	8.69	102	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	9.68	1.8	ng/L	9.23	105	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	11.4	1.8	ng/L	8.86	129	67-138
Perfluorodecanoic acid (PFDA)	11.5	1.8	ng/L	9.23	125	71-129
Perfluorododecanoic acid (PFDoA)	11.3	1.8	ng/L	9.23	123	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	8.35	1.8	ng/L	8.21	102	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

Batch B336788 - SOP 454-PFAAS
LCS (B336788-BS1)

Prepared: 04/17/23 Analyzed: 04/27/23

Perfluoroheptanesulfonic acid (PFHpS)	10.6	1.8	ng/L	8.81		120	69-134			
N-EtFOSAA (NEtFOSAA)	11.0	1.8	ng/L	9.23		120	61-135			
N-MeFOSAA (NMeFOSAA)	12.4	1.8	ng/L	9.23		135	65-136			
Perfluorotetradecanoic acid (PFTA)	11.2	1.8	ng/L	9.23		122	71-132			
Perfluorotridecanoic acid (PFTTrDA)	13.1	1.8	ng/L	9.23		142	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.5	1.8	ng/L	8.63		122	63-143			
Perfluorodecanesulfonic acid (PFDS)	8.06	1.8	ng/L	8.91		90.5	53-142			
Perfluorooctanesulfonamide (FOSA)	11.3	1.8	ng/L	9.23		122	67-137			
Perfluorononanesulfonic acid (PFNS)	10.2	1.8	ng/L	8.86		116	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	9.62	1.8	ng/L	9.23		104	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	9.82	1.8	ng/L	9.23		106	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	10.3	1.8	ng/L	8.44		122	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	10.2	1.8	ng/L	9.23		111	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	9.15	1.8	ng/L	9.23		99.2	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	9.05	1.8	ng/L	8.77		103	64-140			
Perfluoropentanesulfonic acid (PFPeS)	11.0	1.8	ng/L	8.68		127	71-127			
Perfluoroundecanoic acid (PFUnA)	11.0	1.8	ng/L	9.23		119	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	11.8	1.8	ng/L	9.23		128	58.5-143			
Perfluoroheptanoic acid (PFHpA)	10.7	1.8	ng/L	9.23		116	72-130			
Perfluorooctanoic acid (PFOA)	10.8	1.8	ng/L	9.23		117	71-133			
Perfluorooctanesulfonic acid (PFOS)	9.97	1.8	ng/L	8.54		117	65-140			
Perfluorononanoic acid (PFNA)	11.4	1.8	ng/L	9.23		124	69-130			

Matrix Spike (B336788-MS1)
Source: 23D0977-01

Prepared: 04/17/23 Analyzed: 04/27/23

Perfluorobutanoic acid (PFBA)	14.6	1.9	ng/L	9.35	1.81	137	*	73-129		MS-12
Perfluorobutanesulfonic acid (PFBS)	10.6	1.9	ng/L	8.28	ND	128		72-130		
Perfluoropentanoic acid (PFPeA)	15.4	1.9	ng/L	9.35	4.70	115		72-129		
Perfluorohexanoic acid (PFHxA)	18.4	1.9	ng/L	9.35	6.26	130	*	72-129		MS-22
11Cl-PF3OUdS (F53B Major)	10.0	1.9	ng/L	8.81	ND	114		58.3-140		
9Cl-PF3ONS (F53B Minor)	9.55	1.9	ng/L	8.72	ND	110		61.4-144		
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.66	1.9	ng/L	8.81	ND	110		62.4-128		
Hexafluoropropylene oxide dimer acid (HFPO-DA)	11.4	1.9	ng/L	9.35	ND	122		36.7-171		
8:2 Fluorotelomersulfonic acid (8:2FTS A)	12.2	1.9	ng/L	8.98	ND	136		67-138		
Perfluorodecanoic acid (PFDA)	11.8	1.9	ng/L	9.35	ND	126		71-129		
Perfluorododecanoic acid (PFDoA)	12.2	1.9	ng/L	9.35	ND	131		72-134		
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	8.82	1.9	ng/L	8.33	ND	106		54.3-149		
Perfluoroheptanesulfonic acid (PFHpS)	12.4	1.9	ng/L	8.93	ND	139	*	69-134		MS-22
N-EtFOSAA (NEtFOSAA)	12.2	1.9	ng/L	9.35	ND	130		61-135		
N-MeFOSAA (NMeFOSAA)	12.6	1.9	ng/L	9.35	ND	135		65-136		
Perfluorotetradecanoic acid (PFTA)	11.6	1.9	ng/L	9.35	ND	124		71-132		
Perfluorotridecanoic acid (PFTTrDA)	12.2	1.9	ng/L	9.35	ND	130		65-144		
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.9	1.9	ng/L	8.75	ND	124		63-143		
Perfluorodecanesulfonic acid (PFDS)	12.2	1.9	ng/L	9.03	1.35	120		53-142		
Perfluorooctanesulfonamide (FOSA)	11.4	1.9	ng/L	9.35	ND	121		67-137		
Perfluorononanesulfonic acid (PFNS)	12.5	1.9	ng/L	8.98	ND	140	*	69-127		MS-22
Perfluoro-1-hexanesulfonamide (FHxSA)	10.5	1.9	ng/L	9.35	1.60	94.6		64.2-154		
Perfluoro-1-butanefulfonamide (FBSA)	10.3	1.9	ng/L	9.35	ND	110		65.9-140		
Perfluorohexanesulfonic acid (PFHxS)	22.1	1.9	ng/L	8.56	11.0	129		68-131		
Perfluoro-4-oxapentanoic acid (PFMPA)	12.1	1.9	ng/L	9.35	ND	129		61.9-143		
Perfluoro-5-oxahexanoic acid (PFMBA)	9.54	1.9	ng/L	9.35	ND	102		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

Batch B336788 - SOP 454-PFAAS

Matrix Spike (B336788-MS1)		Source: 23D0977-01		Prepared: 04/17/23		Analyzed: 04/27/23				
6:2 Fluorotelomersulfonic acid (6:2FTS A)	17.1	1.9	ng/L	8.89	8.88	93.0	64-140			
Perfluoropetanesulfonic acid (PFPeS)	11.7	1.9	ng/L	8.79	0.866	123	71-127			
Perfluoroundecanoic acid (PFUnA)	19.1	1.9	ng/L	9.35	7.10	128	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	12.5	1.9	ng/L	9.35	ND	134	62-138			
Perfluoroheptanoic acid (PFHpA)	14.0	1.9	ng/L	9.35	3.34	114	72-130			
Perfluorooctanoic acid (PFOA)	13.0	1.9	ng/L	9.35	1.43	124	71-133			
Perfluorooctanesulfonic acid (PFOS)	116	1.9	ng/L	8.65	120	-44.0 *	65-140			MS-09
Perfluorononanoic acid (PFNA)	15.2	1.9	ng/L	9.35	4.05	119	69-130			

Matrix Spike Dup (B336788-MSD1)		Source: 23D0977-01		Prepared: 04/17/23		Analyzed: 04/27/23				
Perfluorobutanoic acid (PFBA)	14.3	1.9	ng/L	9.53	1.81	131 *	73-129	2.24	30	MS-12
Perfluorobutanesulfonic acid (PFBS)	10.4	1.9	ng/L	8.43	ND	123	72-130	2.16	30	
Perfluoropentanoic acid (PFPeA)	14.9	1.9	ng/L	9.53	4.70	107	72-129	3.34	30	
Perfluorohexanoic acid (PFHxA)	17.6	1.9	ng/L	9.53	6.26	119	72-129	4.27	30	
11Cl-PF3OUdS (F53B Major)	8.94	1.9	ng/L	8.98	ND	99.6	58.3-140	11.5	30	
9Cl-PF3ONS (F53B Minor)	8.90	1.9	ng/L	8.88	ND	100	61.4-144	7.10	30	
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	9.54	1.9	ng/L	8.98	ND	106	62.4-128	1.18	30	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	10.9	1.9	ng/L	9.53	ND	115	36.7-171	4.18	30	
8:2 Fluorotelomersulfonic acid (8:2FTS A)	11.2	1.9	ng/L	9.15	ND	122	67-138	8.50	30	
Perfluorodecanoic acid (PFDA)	12.0	1.9	ng/L	9.53	ND	126	71-129	1.35	30	
Perfluorododecanoic acid (PFDoA)	11.3	1.9	ng/L	9.53	ND	119	72-134	8.06	30	
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEA)	8.40	1.9	ng/L	8.48	ND	99.0	54.3-149	4.94	30	
Perfluoroheptanesulfonic acid (PFHpS)	10.9	1.9	ng/L	9.10	ND	120	69-134	12.9	30	
N-EtFOSAA (NEtFOSAA)	12.1	1.9	ng/L	9.53	ND	127	61-135	0.582	30	
N-MeFOSAA (NMeFOSAA)	11.9	1.9	ng/L	9.53	ND	125	65-136	5.99	30	
Perfluorotetradecanoic acid (PFTA)	11.6	1.9	ng/L	9.53	ND	122	71-132	0.0445	30	
Perfluorotridecanoic acid (PFTrDA)	13.1	1.9	ng/L	9.53	ND	138	65-144	7.61	30	
4:2 Fluorotelomersulfonic acid (4:2FTS A)	10.6	1.9	ng/L	8.91	ND	119	63-143	2.25	30	
Perfluorodecanesulfonic acid (PFDS)	9.97	1.9	ng/L	9.20	1.35	93.7	53-142	19.8	30	
Perfluorooctanesulfonamide (FOSA)	11.5	1.9	ng/L	9.53	ND	121	67-137	1.19	30	
Perfluorononanesulfonic acid (PFNS)	10.1	1.9	ng/L	9.15	ND	110	69-127	21.7	30	
Perfluoro-1-hexanesulfonamide (FHxSA)	10.5	1.9	ng/L	9.53	1.60	93.0	64.2-154	0.0897	30	
Perfluoro-1-butanedisulfonamide (FBSA)	10.1	1.9	ng/L	9.53	ND	106	65.9-140	2.42	30	
Perfluorohexanesulfonic acid (PFHxS)	20.2	1.9	ng/L	8.72	11.0	105	68-131	9.00	30	
Perfluoro-4-oxapentanoic acid (PFMPA)	12.0	1.9	ng/L	9.53	ND	126	61.9-143	1.21	30	
Perfluoro-5-oxahexanoic acid (PFMBA)	9.26	1.9	ng/L	9.53	ND	97.2	61.4-142	3.05	30	
6:2 Fluorotelomersulfonic acid (6:2FTS A)	16.2	1.9	ng/L	9.05	8.88	81.2	64-140	5.46	30	
Perfluoropetanesulfonic acid (PFPeS)	11.5	1.9	ng/L	8.96	0.866	119	71-127	0.998	30	
Perfluoroundecanoic acid (PFUnA)	17.4	1.9	ng/L	9.53	7.10	109	69-133	9.02	30	
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	12.5	1.9	ng/L	9.53	ND	131	62-138	0.00704	30	
Perfluoroheptanoic acid (PFHpA)	14.4	1.9	ng/L	9.53	3.34	116	72-130	2.70	30	
Perfluorooctanoic acid (PFOA)	13.2	1.9	ng/L	9.53	1.43	124	71-133	1.37	30	
Perfluorooctanesulfonic acid (PFOS)	114	1.9	ng/L	8.81	120	-71.0 *	65-140	2.13	30	MS-09
Perfluorononanoic acid (PFNA)	14.6	1.9	ng/L	9.53	4.05	111	69-130	3.78	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

Batch B338660 - SOP 454-PFAAS
Blank (B338660-BLK1)

Prepared: 05/01/23 Analyzed: 05/09/23

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 (B338660-BS1)

Prepared: 05/01/23 Analyzed: 05/09/23

Perfluorobutanoic acid (PFBA)	9.18	1.9	ng/L	9.25	99.3	73-129
Perfluorobutanesulfonic acid (PFBS)	8.02	1.9	ng/L	8.19	97.9	72-130
Perfluoropentanoic acid (PFPeA)	8.91	1.9	ng/L	9.25	96.3	72-129
Perfluorohexanoic acid (PFHxA)	9.24	1.9	ng/L	9.25	99.8	72-129
11Cl-PF3OUdS (F53B Major)	6.80	1.9	ng/L	8.72	78.1	55.1-141
9Cl-PF3ONS (F53B Minor)	7.38	1.9	ng/L	8.62	85.6	59.6-146
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	8.79	1.9	ng/L	8.72	101	60.3-131
Hexafluoropropylene oxide dimer acid (HFPO-DA)	10.5	1.9	ng/L	9.25	114	37.6-167
8:2 Fluorotelomersulfonic acid (8:2FTS A)	9.93	1.9	ng/L	8.88	112	67-138
Perfluorodecanoic acid (PFDA)	8.86	1.9	ng/L	9.25	95.8	71-129
Perfluorododecanoic acid (PFDoA)	10.1	1.9	ng/L	9.25	109	72-134
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	8.02	1.9	ng/L	8.23	97.3	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

Batch B338660 - SOP 454-PFAAS
LCS (B338660-BS1)

Prepared: 05/01/23 Analyzed: 05/09/23

Perfluoroheptanesulfonic acid (PFHpS)	9.83	1.9	ng/L	8.84		111	69-134			
N-EtFOSAA (NEtFOSAA)	9.23	1.9	ng/L	9.25		99.8	61-135			
N-MeFOSAA (NMeFOSAA)	9.89	1.9	ng/L	9.25		107	65-136			
Perfluorotetradecanoic acid (PFTA)	8.67	1.9	ng/L	9.25		93.7	71-132			
Perfluorotridecanoic acid (PFTrDA)	7.63	1.9	ng/L	9.25		82.5	65-144			
4:2 Fluorotelomersulfonic acid (4:2FTS A)	8.33	1.9	ng/L	8.65		96.3	63-143			
Perfluorodecanesulfonic acid (PFDS)	7.72	1.9	ng/L	8.93		86.5	53-142			
Perfluorooctanesulfonamide (FOSA)	9.14	1.9	ng/L	9.25		98.8	67-137			
Perfluorononanesulfonic acid (PFNS)	8.80	1.9	ng/L	8.88		99.0	69-127			
Perfluoro-1-hexanesulfonamide (FHxSA)	7.38	1.9	ng/L	9.25		79.8	61.7-156			
Perfluoro-1-butanefulfonamide (FBSA)	8.30	1.9	ng/L	9.25		89.7	61.3-145			
Perfluorohexanesulfonic acid (PFHxS)	7.71	1.9	ng/L	8.47		91.1	68-131			
Perfluoro-4-oxapentanoic acid (PFMPA)	7.89	1.9	ng/L	9.25		85.3	59.8-147			
Perfluoro-5-oxahexanoic acid (PFMBA)	8.02	1.9	ng/L	9.25		86.7	59.5-146			
6:2 Fluorotelomersulfonic acid (6:2FTS A)	8.73	1.9	ng/L	8.79		99.3	64-140			
Perfluoropentanesulfonic acid (PFPeS)	8.31	1.9	ng/L	8.70		95.6	71-127			
Perfluoroundecanoic acid (PFUnA)	8.58	1.9	ng/L	9.25		92.8	69-133			
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	7.90	1.9	ng/L	9.25		85.4	58.5-143			
Perfluoroheptanoic acid (PFHpA)	9.12	1.9	ng/L	9.25		98.6	72-130			
Perfluorooctanoic acid (PFOA)	8.36	1.9	ng/L	9.25		90.4	71-133			
Perfluorooctanesulfonic acid (PFOS)	8.15	1.9	ng/L	8.56		95.2	65-140			
Perfluorononanoic acid (PFNA)	8.35	1.9	ng/L	9.25		90.3	69-130			

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 interference.
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-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.
S-29	Extracted Internal Standard is outside of control limits.
V-05	Continuing calibration verification (CCV) did not meet method specifications and was biased on the low side for this compound.
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-39 (23D0977-01RE1) Lab File ID: 23D0977-01RE1.d Analyzed: 05/09/23 23:45									
M8FOSA	213478.7	4.044533	238,694.00	4.044533	89	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	60184.06	2.529667	61,329.00	2.537883	98	50 - 150	-0.0082	+/-0.50	
M2PFTA	504196.2	4.30535	471,133.00	4.313416	107	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	131711.8	3.8028	40,150.00	3.8028	328	50 - 150	0.0000	+/-0.50	*
MPFBA	475300.3	1.0917	442,652.00	1.091717	107	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	124689.9	2.86385	119,328.00	2.872033	104	50 - 150	-0.0082	+/-0.50	
M6PFDA	452156.1	3.803317	393,323.00	3.803317	115	50 - 150	0.0000	+/-0.50	
M3PFBS	141657.3	1.928117	127,633.00	1.9364	111	50 - 150	-0.0083	+/-0.50	
M7PFUnA	353910.5	3.93805	368,504.00	3.946033	96	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	44129.41	3.453283	32,535.00	3.461417	136	50 - 150	-0.0081	+/-0.50	
M5PFPeA	399141.6	1.749417	345,458.00	1.749417	116	50 - 150	0.0000	+/-0.50	
M5PFHxA	685908.5	2.6134	570,567.00	2.621617	120	50 - 150	-0.0082	+/-0.50	
M3PFHxS	103250	3.2345	89,083.00	3.2345	116	50 - 150	0.0000	+/-0.50	
M4PFHpA	706783.8	3.2031	587,200.00	3.203083	120	50 - 150	0.0000	+/-0.50	
M8PFOA	653961.3	3.469933	536,603.00	3.469917	122	50 - 150	0.0000	+/-0.50	
M8PFOS	78666.91	3.652167	67,719.00	3.65215	116	50 - 150	0.0000	+/-0.50	
M9PFNA	476611.9	3.6532	375,001.00	3.6532	127	50 - 150	0.0000	+/-0.50	
MPFDoA	318565.8	4.072667	347,389.00	4.072667	92	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	80732.56	3.945517	86,761.00	3.9535	93	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	96161.36	3.873783	94,164.00	3.88175	102	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
PFW-1 (23D0977-02RE1) Lab File ID: 23D0977-02RE1.d Analyzed: 05/09/23 23:52									
M8FOSA	190385.5	4.044533	238,694.00	4.044533	80	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	54215.29	2.52145	61,329.00	2.537883	88	50 - 150	-0.0164	+/-0.50	
M2PFTA	481236.7	4.297283	471,133.00	4.313416	102	50 - 150	-0.0161	+/-0.50	
M2-8:2FTS	166019.2	3.8028	40,150.00	3.8028	413	50 - 150	0.0000	+/-0.50	*
MPFBA	445491.5	1.0917	442,652.00	1.091717	101	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	141187.1	2.855667	119,328.00	2.872033	118	50 - 150	-0.0164	+/-0.50	
M6PFDA	426583.2	3.79535	393,323.00	3.803317	108	50 - 150	-0.0080	+/-0.50	
M3PFBS	125020.7	1.919817	127,633.00	1.9364	98	50 - 150	-0.0166	+/-0.50	
M7PFUnA	380008.7	3.93805	368,504.00	3.946033	103	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	45822.91	3.453283	32,535.00	3.461417	141	50 - 150	-0.0081	+/-0.50	
M5PFPeA	350869.3	1.741133	345,458.00	1.749417	102	50 - 150	-0.0083	+/-0.50	
M5PFHxA	597593.3	2.605183	570,567.00	2.621617	105	50 - 150	-0.0164	+/-0.50	
M3PFHxS	78779.77	3.2345	89,083.00	3.2345	88	50 - 150	0.0000	+/-0.50	
M4PFHpA	611089.2	3.195017	587,200.00	3.203083	104	50 - 150	-0.0081	+/-0.50	
M8PFOA	548415.1	3.461933	536,603.00	3.469917	102	50 - 150	-0.0080	+/-0.50	
M8PFOS	20858.24	3.652167	67,719.00	3.65215	31	50 - 150	0.0000	+/-0.50	*
M9PFNA	121611.2	3.6532	375,001.00	3.6532	32	50 - 150	0.0000	+/-0.50	*
MPFDoA	353455.4	4.064683	347,389.00	4.072667	102	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	82464.23	3.945517	86,761.00	3.9535	95	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	94123.89	3.865617	94,164.00	3.88175	100	50 - 150	-0.0161	+/-0.50	
PFW-1 (23D0977-02RE2) Lab File ID: 23D0977-02RE2.d Analyzed: 05/11/23 02:42									
M3PFHxS	101019.6	3.226433	90,122.00	3.226417	112	50 - 150	0.0000	+/-0.50	
M8PFOA	709885.8	3.46195	518,833.00	3.46195	137	50 - 150	0.0000	+/-0.50	
M8PFOS	65424.66	3.644183	69,191.00	3.644183	95	50 - 150	0.0000	+/-0.50	
PFW-1 (23D0977-02RE5) Lab File ID: 23D0977-02RE5.d Analyzed: 05/11/23 02:50									
M8PFOS	76755.96	3.644167	69,191.00	3.644183	111	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 (23D0977-03RE1) Lab File ID: 23D0977-03RE1.d Analyzed: 05/09/23 23:59									
M8FOSA	195897.9	4.04455	238,694.00	4.044533	82	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	56326.35	2.51325	61,329.00	2.537883	92	50 - 150	-0.0246	+/-0.50	
M2PFTA	486816.1	4.289217	471,133.00	4.313416	103	50 - 150	-0.0242	+/-0.50	
M2-8:2FTS	62629.13	3.79485	40,150.00	3.8028	156	50 - 150	-0.0080	+/-0.50	*
MPFBA	442980.5	1.0917	442,652.00	1.091717	100	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	114243.5	2.855683	119,328.00	2.872033	96	50 - 150	-0.0164	+/-0.50	
M6PFDA	482293.5	3.795367	393,323.00	3.803317	123	50 - 150	-0.0079	+/-0.50	
M3PFBS	136770.3	1.919817	127,633.00	1.9364	107	50 - 150	-0.0166	+/-0.50	
M7PFUnA	361978	3.930067	368,504.00	3.946033	98	50 - 150	-0.0160	+/-0.50	
M2-6:2FTS	33835.11	3.453283	32,535.00	3.461417	104	50 - 150	-0.0081	+/-0.50	
M5PFPeA	372154.1	1.741117	345,458.00	1.749417	108	50 - 150	-0.0083	+/-0.50	
M5PFHxA	639036.1	2.6052	570,567.00	2.621617	112	50 - 150	-0.0164	+/-0.50	
M3PFHxS	86234.73	3.226433	89,083.00	3.2345	97	50 - 150	-0.0081	+/-0.50	
M4PFHpA	664555.8	3.195033	587,200.00	3.203083	113	50 - 150	-0.0080	+/-0.50	
M8PFOA	625293	3.46195	536,603.00	3.469917	117	50 - 150	-0.0080	+/-0.50	
M8PFOS	67540.55	3.644183	67,719.00	3.65215	100	50 - 150	-0.0080	+/-0.50	
M9PFNA	378022.4	3.645217	375,001.00	3.6532	101	50 - 150	-0.0080	+/-0.50	
MPFDoA	292425	4.064683	347,389.00	4.072667	84	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	77791.12	3.937533	86,761.00	3.9535	90	50 - 150	-0.0160	+/-0.50	
D3-NMeFOSAA	80515.43	3.865633	94,164.00	3.88175	86	50 - 150	-0.0161	+/-0.50	
PFW-5 (23D0977-03RE3) Lab File ID: 23D0977-03RE3.d Analyzed: 05/11/23 02:57									
M3PFHxS	95429.21	3.226417	90,122.00	3.226417	106	50 - 150	0.0000	+/-0.50	
M8PFOS	79541.43	3.644167	69,191.00	3.644183	115	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 (23D0977-04RE1) Lab File ID: 23D0977-04RE1.d Analyzed: 05/10/23 00:06									
M8FOSA	177064	4.04455	238,694.00	4.044533	74	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	54201.45	2.505033	61,329.00	2.537883	88	50 - 150	-0.0328	+/-0.50	
M2PFTA	433910.2	4.289217	471,133.00	4.313416	92	50 - 150	-0.0242	+/-0.50	
M2-8:2FTS	61618.56	3.786867	40,150.00	3.8028	153	50 - 150	-0.0159	+/-0.50	*
MPFBA	438797.1	1.0834	442,652.00	1.091717	99	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	129035.4	2.847483	119,328.00	2.872033	108	50 - 150	-0.0246	+/-0.50	
M6PFDA	424111.4	3.787383	393,323.00	3.803317	108	50 - 150	-0.0159	+/-0.50	
M3PFBS	132863.9	1.911533	127,633.00	1.9364	104	50 - 150	-0.0249	+/-0.50	
M7PFUnA	328482.8	3.922067	368,504.00	3.946033	89	50 - 150	-0.0240	+/-0.50	
M2-6:2FTS	37137.85	3.445283	32,535.00	3.461417	114	50 - 150	-0.0161	+/-0.50	
M5PFPeA	351506.1	1.731383	345,458.00	1.749417	102	50 - 150	-0.0180	+/-0.50	
M5PFHxA	619326.8	2.596983	570,567.00	2.621617	109	50 - 150	-0.0246	+/-0.50	
M3PFHxS	90505.7	3.226417	89,083.00	3.2345	102	50 - 150	-0.0081	+/-0.50	
M4PFHpA	621196.6	3.186933	587,200.00	3.203083	106	50 - 150	-0.0162	+/-0.50	
M8PFOA	582623.1	3.453817	536,603.00	3.469917	109	50 - 150	-0.0161	+/-0.50	
M8PFOS	60456.27	3.644183	67,719.00	3.65215	89	50 - 150	-0.0080	+/-0.50	
M9PFNA	368237.2	3.645217	375,001.00	3.6532	98	50 - 150	-0.0080	+/-0.50	
MPFDoA	279815	4.056684	347,389.00	4.072667	81	50 - 150	-0.0160	+/-0.50	
D5-NEtFOSAA	69869.98	3.929533	86,761.00	3.9535	81	50 - 150	-0.0240	+/-0.50	
D3-NMeFOSAA	89136.55	3.857683	94,164.00	3.88175	95	50 - 150	-0.0241	+/-0.50	
PC-28 (23D0977-04RE3) Lab File ID: 23D0977-04RE3.d Analyzed: 05/11/23 03:04									
M8PFOS	69930.48	3.644183	69,191.00	3.644183	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
OW-8A (23D0977-05RE1) Lab File ID: 23D0977-05RE1.d Analyzed: 05/10/23 00:13									
M8FOSA	180029.9	4.044533	238,694.00	4.044533	75	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	108777.1	2.4804	61,329.00	2.537883	177	50 - 150	-0.0575	+/-0.50	*
M2PFTA	433007	4.281133	471,133.00	4.313416	92	50 - 150	-0.0323	+/-0.50	
M2-8:2FTS	104346.6	3.786867	40,150.00	3.8028	260	50 - 150	-0.0159	+/-0.50	*
MPFBA	365952	1.0834	442,652.00	1.091717	83	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	89812.97	2.822933	119,328.00	2.872033	75	50 - 150	-0.0491	+/-0.50	
M6PFDA	402035.8	3.787383	393,323.00	3.803317	102	50 - 150	-0.0159	+/-0.50	
M3PFBS	104498.8	1.894967	127,633.00	1.9364	82	50 - 150	-0.0414	+/-0.50	
M7PFUnA	367650	3.922067	368,504.00	3.946033	100	50 - 150	-0.0240	+/-0.50	
M2-6:2FTS	87928.01	3.4373	32,535.00	3.461417	270	50 - 150	-0.0241	+/-0.50	*
M5PFPeA	291981.7	1.714833	345,458.00	1.749417	85	50 - 150	-0.0346	+/-0.50	
M5PFHxA	494024	2.572333	570,567.00	2.621617	87	50 - 150	-0.0493	+/-0.50	
M3PFHxS	79764.23	3.210267	89,083.00	3.2345	90	50 - 150	-0.0242	+/-0.50	
M4PFHpA	561385.4	3.178867	587,200.00	3.203083	96	50 - 150	-0.0242	+/-0.50	
M8PFOA	514316.3	3.453833	536,603.00	3.469917	96	50 - 150	-0.0161	+/-0.50	
M8PFOS	56559.09	3.6362	67,719.00	3.65215	84	50 - 150	-0.0159	+/-0.50	
M9PFNA	372382.7	3.637233	375,001.00	3.6532	99	50 - 150	-0.0160	+/-0.50	
MPFDoA	316377.7	4.048683	347,389.00	4.072667	91	50 - 150	-0.0240	+/-0.50	
D5-NEtFOSAA	91632.85	3.929533	86,761.00	3.9535	106	50 - 150	-0.0240	+/-0.50	
D3-NMeFOSAA	105877.4	3.857667	94,164.00	3.88175	112	50 - 150	-0.0241	+/-0.50	
OW-8A (23D0977-05RE3) Lab File ID: 23D0977-05RE3.d Analyzed: 05/11/23 03:11									
M3PFHxS	94987.45	3.226433	90,122.00	3.226417	105	50 - 150	0.0000	+/-0.50	
M8PFOS	65556.15	3.644183	69,191.00	3.644183	95	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 (23D0977-06RE1) Lab File ID: 23D0977-06RE1.d Analyzed: 05/10/23 00:21									
M8FOSA	139894.5	4.044533	238,694.00	4.044533	59	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	39033.11	2.496817	61,329.00	2.537883	64	50 - 150	-0.0411	+/-0.50	
M2PFTA	376591.1	4.281133	471,133.00	4.313416	80	50 - 150	-0.0323	+/-0.50	
M2-8:2FTS	60435.72	3.786867	40,150.00	3.8028	151	50 - 150	-0.0159	+/-0.50	*
MPFBA	341270.4	1.0834	442,652.00	1.091717	77	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	98563.73	2.8393	119,328.00	2.872033	83	50 - 150	-0.0327	+/-0.50	
M6PFDA	315859.4	3.787383	393,323.00	3.803317	80	50 - 150	-0.0159	+/-0.50	
M3PFBS	99443.16	1.90325	127,633.00	1.9364	78	50 - 150	-0.0331	+/-0.50	
M7PFUnA	246362.7	3.922067	368,504.00	3.946033	67	50 - 150	-0.0240	+/-0.50	
M2-6:2FTS	172212.6	3.4373	32,535.00	3.461417	529	50 - 150	-0.0241	+/-0.50	*
M5PFPeA	249545.6	1.7231	345,458.00	1.749417	72	50 - 150	-0.0263	+/-0.50	
M5PFHxA	404671.3	2.58055	570,567.00	2.621617	71	50 - 150	-0.0411	+/-0.50	
M3PFHxS	57335.62	3.218333	89,083.00	3.2345	64	50 - 150	-0.0162	+/-0.50	
M4PFHpA	442922	3.186933	587,200.00	3.203083	75	50 - 150	-0.0162	+/-0.50	
M8PFOA	332528.8	3.453817	536,603.00	3.469917	62	50 - 150	-0.0161	+/-0.50	
M8PFOS	45851.4	3.6362	67,719.00	3.65215	68	50 - 150	-0.0159	+/-0.50	
M9PFNA	240221.5	3.637233	375,001.00	3.6532	64	50 - 150	-0.0160	+/-0.50	
MPFDoA	233656.2	4.056684	347,389.00	4.072667	67	50 - 150	-0.0160	+/-0.50	
D5-NEtFOSAA	55931.29	3.929533	86,761.00	3.9535	64	50 - 150	-0.0240	+/-0.50	
D3-NMeFOSAA	69836.77	3.857667	94,164.00	3.88175	74	50 - 150	-0.0241	+/-0.50	
PFW-2 (23D0977-06RE4) Lab File ID: 23D0977-06RE4.d Analyzed: 05/11/23 03:18									
M2-8:2FTS	49383.49	3.786867	48,895.00	3.786867	101	50 - 150	0.0000	+/-0.50	
M7PFUnA	408403.2	3.930067	380,840.00	3.922067	107	50 - 150	0.0080	+/-0.50	
M5PFPeA	394347.8	1.731383	363,549.00	1.731383	108	50 - 150	0.0000	+/-0.50	
M5PFHxA	688375.1	2.596983	603,066.00	2.596983	114	50 - 150	0.0000	+/-0.50	
M3PFHxS	101597.9	3.226417	90,122.00	3.226417	113	50 - 150	0.0000	+/-0.50	
M4PFHpA	704076.8	3.18695	622,459.00	3.18695	113	50 - 150	0.0000	+/-0.50	
M8PFOA	625005.4	3.46195	518,833.00	3.46195	120	50 - 150	0.0000	+/-0.50	
M8PFOS	74805.46	3.644183	69,191.00	3.644183	108	50 - 150	0.0000	+/-0.50	
PFW-2 (23D0977-06RE5) Lab File ID: 23D0977-06RE5R.d Analyzed: 05/12/23 12:52									
M2-6:2FTS	41459.35	3.4453	34,374.00	3.4373	121	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-4.4.23 (23D0977-07) Lab File ID: 23D0977-07.d Analyzed: 04/27/23 16:10									
M8FOSA	154915.2	4.052516	229,751.00	4.052516	67	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	44718.38	2.562517	63,052.00	2.5543	71	50 - 150	0.0082	+/-0.50	
M2PFTA	442455.2	4.329667	625,482.00	4.329667	71	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	171914.2	3.818717	36,800.00	3.818733	467	50 - 150	0.0000	+/-0.50	*
MPFBA	394330.5	1.100017	413,982.00	1.100017	95	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	114206.3	2.896583	127,387.00	2.8884	90	50 - 150	0.0082	+/-0.50	
M6PFDA	419992.5	3.81925	434,091.00	3.81925	97	50 - 150	0.0000	+/-0.50	
M3PFBS	112321.6	1.95315	132,489.00	1.95315	85	50 - 150	0.0000	+/-0.50	
M7PFUnA	379011	3.962017	435,821.00	3.962017	87	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	27086.61	3.469383	32,472.00	3.469383	83	50 - 150	0.0000	+/-0.50	
M5PFPeA	283831.1	1.7743	326,410.00	1.766017	87	50 - 150	0.0083	+/-0.50	
M5PFHxA	501308.9	2.646767	600,288.00	2.646767	84	50 - 150	0.0000	+/-0.50	
M3PFHxS	86192.1	3.250667	102,169.00	3.250667	84	50 - 150	0.0000	+/-0.50	
M4PFHpA	514265.8	3.219533	635,701.00	3.21145	81	50 - 150	0.0081	+/-0.50	
M8PFOA	525446.3	3.485883	615,023.00	3.485883	85	50 - 150	0.0000	+/-0.50	
M8PFOS	67162.71	3.668117	80,318.00	3.668117	84	50 - 150	0.0000	+/-0.50	
M9PFNA	387093.3	3.66915	485,671.00	3.66915	80	50 - 150	0.0000	+/-0.50	
MPFDoA	348141.3	4.096633	427,448.00	4.096633	81	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	79907.7	3.969483	101,283.00	3.969483	79	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	76272.71	3.889733	100,758.00	3.889733	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
EB-4.5.23 (23D0977-08) Lab File ID: 23D0977-08.d Analyzed: 04/27/23 16:17									
M8FOSA	172950.8	4.052516	229,751.00	4.052516	75	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	54499.35	2.562517	63,052.00	2.5543	86	50 - 150	0.0082	+/-0.50	
M2PFTA	530098.1	4.329667	625,482.00	4.329667	85	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	213528.7	3.818717	36,800.00	3.818733	580	50 - 150	0.0000	+/-0.50	*
MPFBA	445952.3	1.100017	413,982.00	1.100017	108	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	139756.1	2.896583	127,387.00	2.8884	110	50 - 150	0.0082	+/-0.50	
M6PFDA	476501.2	3.81925	434,091.00	3.81925	110	50 - 150	0.0000	+/-0.50	
M3PFBS	127548.4	1.95315	132,489.00	1.95315	96	50 - 150	0.0000	+/-0.50	
M7PFUnA	403615	3.962017	435,821.00	3.962017	93	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	34007.62	3.469383	32,472.00	3.469383	105	50 - 150	0.0000	+/-0.50	
M5PFPeA	321947.1	1.7743	326,410.00	1.766017	99	50 - 150	0.0083	+/-0.50	
M5PFHxA	559883.1	2.646767	600,288.00	2.646767	93	50 - 150	0.0000	+/-0.50	
M3PFHxS	96698.86	3.250667	102,169.00	3.250667	95	50 - 150	0.0000	+/-0.50	
M4PFHpA	600519	3.219533	635,701.00	3.21145	94	50 - 150	0.0081	+/-0.50	
M8PFOA	572072.2	3.485883	615,023.00	3.485883	93	50 - 150	0.0000	+/-0.50	
M8PFOS	80946.38	3.668117	80,318.00	3.668117	101	50 - 150	0.0000	+/-0.50	
M9PFNA	456462	3.66915	485,671.00	3.66915	94	50 - 150	0.0000	+/-0.50	
MPFDoA	379112	4.096633	427,448.00	4.096633	89	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	83507.4	3.969483	101,283.00	3.969483	82	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	90965.43	3.889733	100,758.00	3.889733	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
MW-12S (23D0977-09) Lab File ID: 23D0977-09.d Analyzed: 04/27/23 16:25									
M8FOSA	156979	4.052516	229,751.00	4.052516	68	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	53954.84	2.562517	63,052.00	2.5543	86	50 - 150	0.0082	+/-0.50	
M2PFTA	471471.3	4.329667	625,482.00	4.329667	75	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	108137	3.818733	36,800.00	3.818733	294	50 - 150	0.0000	+/-0.50	*
MPFBA	299857.9	1.100017	413,982.00	1.100017	72	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	106007	2.8884	127,387.00	2.8884	83	50 - 150	0.0000	+/-0.50	
M6PFDA	404795	3.81925	434,091.00	3.81925	93	50 - 150	0.0000	+/-0.50	
M3PFBS	111322.5	1.95315	132,489.00	1.95315	84	50 - 150	0.0000	+/-0.50	
M7PFUnA	370143.5	3.962017	435,821.00	3.962017	85	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	39339.09	3.469383	32,472.00	3.469383	121	50 - 150	0.0000	+/-0.50	
M5PFPeA	278820.6	1.766017	326,410.00	1.766017	85	50 - 150	0.0000	+/-0.50	
M5PFHxA	505028.9	2.646767	600,288.00	2.646767	84	50 - 150	0.0000	+/-0.50	
M3PFHxS	84047.38	3.250667	102,169.00	3.250667	82	50 - 150	0.0000	+/-0.50	
M4PFHpA	527823.3	3.219533	635,701.00	3.21145	83	50 - 150	0.0081	+/-0.50	
M8PFOA	503520.9	3.485883	615,023.00	3.485883	82	50 - 150	0.0000	+/-0.50	
M8PFOS	61575.28	3.668117	80,318.00	3.668117	77	50 - 150	0.0000	+/-0.50	
M9PFNA	359598.2	3.669167	485,671.00	3.66915	74	50 - 150	0.0000	+/-0.50	
MPFDoA	318799.3	4.096633	427,448.00	4.096633	75	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	75089.57	3.969483	101,283.00	3.969483	74	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	80271.3	3.889733	100,758.00	3.889733	80	50 - 150	0.0000	+/-0.50	
MW-12S (23D0977-09RE1) Lab File ID: 23D0977-09RE1.d Analyzed: 05/02/23 09:15									
M3PFHxS	75270.26	3.242583	61,466.00	3.242583	122	50 - 150	0.0000	+/-0.50	
M8PFOS	66539.34	3.660133	60,383.00	3.668117	110	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
MW-22 (23D0977-10)		Lab File ID: 23D0977-10.d				Analyzed: 04/27/23 16:32			
M8FOSA	152249.5	4.052516	229,751.00	4.052516	66	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	36337.71	2.562517	63,052.00	2.5543	58	50 - 150	0.0082	+/-0.50	
M2PFTA	305934.9	4.329667	625,482.00	4.329667	49	50 - 150	0.0000	+/-0.50	*
M2-8:2FTS	132070.5	3.818717	36,800.00	3.818733	359	50 - 150	0.0000	+/-0.50	*
MPFBA	331211.8	1.108317	413,982.00	1.100017	80	50 - 150	0.0083	+/-0.50	
M3HFPO-DA	101532.7	2.896583	127,387.00	2.8884	80	50 - 150	0.0082	+/-0.50	
M6PFDA	364815.6	3.81925	434,091.00	3.81925	84	50 - 150	0.0000	+/-0.50	
M3PFBS	109878.8	1.95315	132,489.00	1.95315	83	50 - 150	0.0000	+/-0.50	
M7PFUnA	302387	3.962017	435,821.00	3.962017	69	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	28715.11	3.469383	32,472.00	3.469383	88	50 - 150	0.0000	+/-0.50	
M5PFPeA	278678.4	1.7743	326,410.00	1.766017	85	50 - 150	0.0083	+/-0.50	
M5PFHxA	461602.1	2.655	600,288.00	2.646767	77	50 - 150	0.0082	+/-0.50	
M3PFHxS	79796.02	3.250667	102,169.00	3.250667	78	50 - 150	0.0000	+/-0.50	
M4PFHpA	468372.9	3.219533	635,701.00	3.21145	74	50 - 150	0.0081	+/-0.50	
M8PFOA	444038.6	3.485883	615,023.00	3.485883	72	50 - 150	0.0000	+/-0.50	
M8PFOS	62996.09	3.668117	80,318.00	3.668117	78	50 - 150	0.0000	+/-0.50	
M9PFNA	309111.2	3.66915	485,671.00	3.66915	64	50 - 150	0.0000	+/-0.50	
MPFDoA	250852.2	4.096633	427,448.00	4.096633	59	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	58013.38	3.969483	101,283.00	3.969483	57	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	67587.39	3.889733	100,758.00	3.889733	67	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 (23D0977-11) Lab File ID: 23D0977-11.d Analyzed: 04/27/23 16:39									
M8FOSA	165415.1	4.052516	229,751.00	4.052516	72	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	44909.18	2.562517	63,052.00	2.5543	71	50 - 150	0.0082	+/-0.50	
M2PFTA	399933.2	4.329667	625,482.00	4.329667	64	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	112953.5	3.818733	36,800.00	3.818733	307	50 - 150	0.0000	+/-0.50	*
MPFBA	297262.6	1.100017	413,982.00	1.100017	72	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	97741.89	2.896583	127,387.00	2.8884	77	50 - 150	0.0082	+/-0.50	
M6PFDA	355879.1	3.81925	434,091.00	3.81925	82	50 - 150	0.0000	+/-0.50	
M3PFBS	104650.8	1.95315	132,489.00	1.95315	79	50 - 150	0.0000	+/-0.50	
M7PFUnA	346784.7	3.962017	435,821.00	3.962017	80	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	39372.21	3.469383	32,472.00	3.469383	121	50 - 150	0.0000	+/-0.50	
M5PFPeA	266757.7	1.766017	326,410.00	1.766017	82	50 - 150	0.0000	+/-0.50	
M5PFHxA	436937.8	2.646767	600,288.00	2.646767	73	50 - 150	0.0000	+/-0.50	
M3PFHxS	76007.67	3.250667	102,169.00	3.250667	74	50 - 150	0.0000	+/-0.50	
M4PFHpA	461943.1	3.219533	635,701.00	3.21145	73	50 - 150	0.0081	+/-0.50	
M8PFOA	447933	3.485883	615,023.00	3.485883	73	50 - 150	0.0000	+/-0.50	
M8PFOS	56912.75	3.668117	80,318.00	3.668117	71	50 - 150	0.0000	+/-0.50	
M9PFNA	287257.2	3.66915	485,671.00	3.66915	59	50 - 150	0.0000	+/-0.50	
MPFDoA	304586.1	4.096633	427,448.00	4.096633	71	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	65606.86	3.969483	101,283.00	3.969483	65	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	71638.7	3.889733	100,758.00	3.889733	71	50 - 150	0.0000	+/-0.50	
PC-16D (23D0977-11RE1) Lab File ID: 23D0977-11RE1.d Analyzed: 05/02/23 09:23									
M3PFHxS	71564.84	3.242583	61,466.00	3.242583	116	50 - 150	0.0000	+/-0.50	
M8PFOS	66388.7	3.660133	60,383.00	3.668117	110	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-30 (23D0977-12) Lab File ID: 23D0977-12.d Analyzed: 04/27/23 16:46									
M8FOSA	143972.6	4.052516	229,751.00	4.052516	63	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	37318.14	2.562517	63,052.00	2.5543	59	50 - 150	0.0082	+/-0.50	
M2PFTA	362172.3	4.329667	625,482.00	4.329667	58	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	94680.85	3.818733	36,800.00	3.818733	257	50 - 150	0.0000	+/-0.50	*
MPFBA	304058.9	1.100017	413,982.00	1.100017	73	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	103226.8	2.896583	127,387.00	2.8884	81	50 - 150	0.0082	+/-0.50	
M6PFDA	314730.6	3.81925	434,091.00	3.81925	73	50 - 150	0.0000	+/-0.50	
M3PFBS	100202.7	1.95315	132,489.00	1.95315	76	50 - 150	0.0000	+/-0.50	
M7PFUnA	278708.2	3.962017	435,821.00	3.962017	64	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	25127.03	3.469383	32,472.00	3.469383	77	50 - 150	0.0000	+/-0.50	
M5PFPeA	251960.9	1.7743	326,410.00	1.766017	77	50 - 150	0.0083	+/-0.50	
M5PFHxA	413818.6	2.646767	600,288.00	2.646767	69	50 - 150	0.0000	+/-0.50	
M3PFHxS	72387.17	3.250667	102,169.00	3.250667	71	50 - 150	0.0000	+/-0.50	
M4PFHpA	434068.3	3.219533	635,701.00	3.21145	68	50 - 150	0.0081	+/-0.50	
M8PFOA	405159.7	3.485883	615,023.00	3.485883	66	50 - 150	0.0000	+/-0.50	
M8PFOS	51896.28	3.668117	80,318.00	3.668117	65	50 - 150	0.0000	+/-0.50	
M9PFNA	261222	3.66915	485,671.00	3.66915	54	50 - 150	0.0000	+/-0.50	
MPFDoA	254519.5	4.096633	427,448.00	4.096633	60	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	55622.12	3.969483	101,283.00	3.969483	55	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	64942.3	3.889733	100,758.00	3.889733	64	50 - 150	0.0000	+/-0.50	
PC-30 (23D0977-12RE1) Lab File ID: 23D0977-12RE1.d Analyzed: 05/02/23 09:30									
M8PFOS	68272.98	3.660133	60,383.00	3.668117	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
PC-1 (23D0977-13RE1) Lab File ID: 23D0977-13RE1.d Analyzed: 05/10/23 00:28									
M8FOSA	159141.6	4.044533	238,694.00	4.044533	67	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	46837.71	2.496817	61,329.00	2.537883	76	50 - 150	-0.0411	+/-0.50	
M2PFTA	408392.8	4.281133	471,133.00	4.313416	87	50 - 150	-0.0323	+/-0.50	
M2-8:2FTS	54742.42	3.786867	40,150.00	3.8028	136	50 - 150	-0.0159	+/-0.50	
MPFBA	381051.8	1.0834	442,652.00	1.091717	86	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	119572.1	2.8393	119,328.00	2.872033	100	50 - 150	-0.0327	+/-0.50	
M6PFDA	363756	3.787383	393,323.00	3.803317	92	50 - 150	-0.0159	+/-0.50	
M3PFBS	117264.9	1.90325	127,633.00	1.9364	92	50 - 150	-0.0331	+/-0.50	
M7PFUnA	317191.2	3.92205	368,504.00	3.946033	86	50 - 150	-0.0240	+/-0.50	
M2-6:2FTS	51909.93	3.4373	32,535.00	3.461417	160	50 - 150	-0.0241	+/-0.50	*
M5PFPeA	311747	1.7231	345,458.00	1.749417	90	50 - 150	-0.0263	+/-0.50	
M5PFHxA	519518.9	2.58055	570,567.00	2.621617	91	50 - 150	-0.0411	+/-0.50	
M3PFHxS	76887.95	3.218333	89,083.00	3.2345	86	50 - 150	-0.0162	+/-0.50	
M4PFHpA	534819.1	3.186933	587,200.00	3.203083	91	50 - 150	-0.0162	+/-0.50	
M8PFOA	471839.3	3.453817	536,603.00	3.469917	88	50 - 150	-0.0161	+/-0.50	
M8PFOS	53434.71	3.636183	67,719.00	3.65215	79	50 - 150	-0.0160	+/-0.50	
M9PFNA	324146.5	3.637217	375,001.00	3.6532	86	50 - 150	-0.0160	+/-0.50	
MPFDoA	286705.8	4.056667	347,389.00	4.072667	83	50 - 150	-0.0160	+/-0.50	
D5-NEtFOSAA	60679.06	3.929517	86,761.00	3.9535	70	50 - 150	-0.0240	+/-0.50	
D3-NMeFOSAA	86179.88	3.857667	94,164.00	3.88175	92	50 - 150	-0.0241	+/-0.50	
PC-1 (23D0977-13RE3) Lab File ID: 23D0977-13RE3.d Analyzed: 05/11/23 03:26									
M2-6:2FTS	30786.02	3.445283	32,650.00	3.4453	94	50 - 150	0.0000	+/-0.50	
M3PFHxS	81507.83	3.226417	90,122.00	3.226417	90	50 - 150	0.0000	+/-0.50	
M8PFOS	63810.25	3.644183	69,191.00	3.644183	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
PC-6A (23D0977-14) Lab File ID: 23D0977-14.d Analyzed: 04/27/23 17:01									
M8FOSA	150938.2	4.052516	229,751.00	4.052516	66	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	35512.46	2.562517	63,052.00	2.5543	56	50 - 150	0.0082	+/-0.50	
M2PFTA	373302.8	4.329667	625,482.00	4.329667	60	50 - 150	0.0000	+/-0.50	
M2-8:2FTS	89585.09	3.818733	36,800.00	3.818733	243	50 - 150	0.0000	+/-0.50	*
MPFBA	301942.2	1.100017	413,982.00	1.100017	73	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	111119.4	2.896583	127,387.00	2.8884	87	50 - 150	0.0082	+/-0.50	
M6PFDA	319512.9	3.81925	434,091.00	3.81925	74	50 - 150	0.0000	+/-0.50	
M3PFBS	99032.29	1.95315	132,489.00	1.95315	75	50 - 150	0.0000	+/-0.50	
M7PFUnA	283250.9	3.962017	435,821.00	3.962017	65	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	25442.46	3.469383	32,472.00	3.469383	78	50 - 150	0.0000	+/-0.50	
M5PFPeA	248377.4	1.7743	326,410.00	1.766017	76	50 - 150	0.0083	+/-0.50	
M5PFHxA	420707.8	2.646767	600,288.00	2.646767	70	50 - 150	0.0000	+/-0.50	
M3PFHxS	75135.09	3.250667	102,169.00	3.250667	74	50 - 150	0.0000	+/-0.50	
M4PFHpA	429461	3.219533	635,701.00	3.21145	68	50 - 150	0.0081	+/-0.50	
M8PFOA	390196.2	3.485883	615,023.00	3.485883	63	50 - 150	0.0000	+/-0.50	
M8PFOS	55361.75	3.668117	80,318.00	3.668117	69	50 - 150	0.0000	+/-0.50	
M9PFNA	252094.3	3.66915	485,671.00	3.66915	52	50 - 150	0.0000	+/-0.50	
MPFDoA	272053.1	4.096633	427,448.00	4.096633	64	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	59880.7	3.969483	101,283.00	3.969483	59	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	68568.2	3.889733	100,758.00	3.889733	68	50 - 150	0.0000	+/-0.50	
PC-6A (23D0977-14RE1) Lab File ID: 23D0977-14RE1.d Analyzed: 05/02/23 09:59									
M8PFOS	84783.95	3.660133	60,383.00	3.660133	140	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 (B336788-BLK1) Lab File ID: B336788-BLK1.d Analyzed: 04/27/23 14:22									
M8FOSA	159254.7	4.0525	229,751.00	4.0525	69	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	47720.08	2.570733	63,052.00	2.57895	76	50 - 150	-0.0082	+/-0.50	
M2PFTA	411838	4.329667	625,482.00	4.337783	66	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	98763.36	3.818717	36,800.00	3.82705	268	50 - 150	-0.0083	+/-0.50	*
MPFBA	366883.5	1.100017	413,982.00	1.108317	89	50 - 150	-0.0083	+/-0.50	
M3HFPO-DA	112767.9	2.896583	127,387.00	2.904767	89	50 - 150	-0.0082	+/-0.50	
M6PFDA	367958.2	3.819233	434,091.00	3.827533	85	50 - 150	-0.0083	+/-0.50	
M3PFBS	112656.3	1.96145	132,489.00	1.969733	85	50 - 150	-0.0083	+/-0.50	
M7PFUnA	307683.8	3.962	435,821.00	3.97	71	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	27418.98	3.477367	32,472.00	3.477367	84	50 - 150	0.0000	+/-0.50	
M5PFPeA	285928	1.7743	326,410.00	1.7826	88	50 - 150	-0.0083	+/-0.50	
M5PFHxA	495074.3	2.655	600,288.00	2.663233	82	50 - 150	-0.0082	+/-0.50	
M3PFHxS	82893.62	3.25065	102,169.00	3.258733	81	50 - 150	-0.0081	+/-0.50	
M4PFHpA	529505.4	3.219533	635,701.00	3.227617	83	50 - 150	-0.0081	+/-0.50	
M8PFOA	451716.8	3.485883	615,023.00	3.493867	73	50 - 150	-0.0080	+/-0.50	
M8PFOS	64755.05	3.668117	80,318.00	3.6761	81	50 - 150	-0.0080	+/-0.50	
M9PFNA	373779.4	3.66915	485,671.00	3.677133	77	50 - 150	-0.0080	+/-0.50	
MPFDoA	281309.4	4.096633	427,448.00	4.104617	66	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	71716.5	3.969483	101,283.00	3.977467	71	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	75150.3	3.889717	100,758.00	3.8977	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 (B336788-BS1) Lab File ID: B336788-BS1.d Analyzed: 04/27/23 14:14									
M8FOSA	151200.3	4.0525	229,751.00	4.0525	66	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	46362.85	2.570733	63,052.00	2.57895	74	50 - 150	-0.0082	+/-0.50	
M2PFTA	345679.8	4.329667	625,482.00	4.337783	55	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	82918.51	3.818717	36,800.00	3.82705	225	50 - 150	-0.0083	+/-0.50	*
MPFBA	357218	1.108317	413,982.00	1.108317	86	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	124172.1	2.896583	127,387.00	2.904767	97	50 - 150	-0.0082	+/-0.50	
M6PFDA	347336.3	3.819233	434,091.00	3.827533	80	50 - 150	-0.0083	+/-0.50	
M3PFBS	111879.9	1.96145	132,489.00	1.969733	84	50 - 150	-0.0083	+/-0.50	
M7PFUnA	301370.9	3.962	435,821.00	3.97	69	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	26975.83	3.477367	32,472.00	3.477367	83	50 - 150	0.0000	+/-0.50	
M5PFPeA	281632.3	1.7743	326,410.00	1.7826	86	50 - 150	-0.0083	+/-0.50	
M5PFHxA	482989.8	2.655	600,288.00	2.663233	80	50 - 150	-0.0082	+/-0.50	
M3PFHxS	78700.38	3.25065	102,169.00	3.258733	77	50 - 150	-0.0081	+/-0.50	
M4PFHpA	530554.3	3.219533	635,701.00	3.227617	83	50 - 150	-0.0081	+/-0.50	
M8PFOA	480707.7	3.485883	615,023.00	3.493867	78	50 - 150	-0.0080	+/-0.50	
M8PFOS	65803.85	3.668117	80,318.00	3.6761	82	50 - 150	-0.0080	+/-0.50	
M9PFNA	355230.2	3.66915	485,671.00	3.677133	73	50 - 150	-0.0080	+/-0.50	
MPFDoA	271447.3	4.096633	427,448.00	4.104617	64	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	65525.69	3.969483	101,283.00	3.977467	65	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	64261.33	3.889717	100,758.00	3.8977	64	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 (B336788-MS1) Lab File ID: B336788-MS1.d Analyzed: 04/27/23 14:29									
M8FOSA	105587.4	4.0525	229,751.00	4.0525	46	50 - 150	0.0000	+/-0.50	*
M2-4:2FTS	31871.45	2.570733	63,052.00	2.57895	51	50 - 150	-0.0082	+/-0.50	
M2PFTA	318543.4	4.329667	625,482.00	4.337783	51	50 - 150	-0.0081	+/-0.50	
M2-8:2FTS	97743.75	3.818717	36,800.00	3.82705	266	50 - 150	-0.0083	+/-0.50	*
MPFBA	237877.5	1.108317	413,982.00	1.108317	57	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	78716.66	2.896583	127,387.00	2.904767	62	50 - 150	-0.0082	+/-0.50	
M6PFDA	305608.6	3.81925	434,091.00	3.827533	70	50 - 150	-0.0083	+/-0.50	
M3PFBS	89576.07	1.96145	132,489.00	1.969733	68	50 - 150	-0.0083	+/-0.50	
M7PFUnA	255709	3.962017	435,821.00	3.97	59	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	24112.77	3.469383	32,472.00	3.477367	74	50 - 150	-0.0080	+/-0.50	
M5PFPeA	224034.1	1.7743	326,410.00	1.7826	69	50 - 150	-0.0083	+/-0.50	
M5PFHxA	382065.3	2.655	600,288.00	2.663233	64	50 - 150	-0.0082	+/-0.50	
M3PFHxS	65355.52	3.25065	102,169.00	3.258733	64	50 - 150	-0.0081	+/-0.50	
M4PFHpA	401067.5	3.219533	635,701.00	3.227617	63	50 - 150	-0.0081	+/-0.50	
M8PFOA	368621	3.485883	615,023.00	3.493867	60	50 - 150	-0.0080	+/-0.50	
M8PFOS	49508.52	3.668117	80,318.00	3.6761	62	50 - 150	-0.0080	+/-0.50	
M9PFNA	279408.2	3.66915	485,671.00	3.677133	58	50 - 150	-0.0080	+/-0.50	
MPFDoA	218936.5	4.096633	427,448.00	4.104617	51	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	50985.38	3.969483	101,283.00	3.977467	50	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	52170.27	3.8977	100,758.00	3.8977	52	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 (B336788-MSD1)			Lab File ID: B336788-MSD1.d			Analyzed: 04/27/23 14:36			
M8FOSA	107240.1	4.0525	229,751.00	4.0525	47	50 - 150	0.0000	+/-0.50	*
M2-4:2FTS	34864.3	2.570733	63,052.00	2.57895	55	50 - 150	-0.0082	+/-0.50	
M2PFTA	305370.9	4.329667	625,482.00	4.337783	49	50 - 150	-0.0081	+/-0.50	*
M2-8:2FTS	111212.5	3.818717	36,800.00	3.82705	302	50 - 150	-0.0083	+/-0.50	*
MPFBA	265282.1	1.108317	413,982.00	1.108317	64	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	87841.3	2.896583	127,387.00	2.904767	69	50 - 150	-0.0082	+/-0.50	
M6PFDA	324318	3.81925	434,091.00	3.827533	75	50 - 150	-0.0083	+/-0.50	
M3PFBS	98755.8	1.96145	132,489.00	1.969733	75	50 - 150	-0.0083	+/-0.50	
M7PFUnA	277036.8	3.962017	435,821.00	3.97	64	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	25136.8	3.477367	32,472.00	3.477367	77	50 - 150	0.0000	+/-0.50	
M5PFPeA	249708.8	1.7743	326,410.00	1.7826	77	50 - 150	-0.0083	+/-0.50	
M5PFHxA	427576.9	2.655	600,288.00	2.663233	71	50 - 150	-0.0082	+/-0.50	
M3PFHxS	71391.98	3.25065	102,169.00	3.258733	70	50 - 150	-0.0081	+/-0.50	
M4PFHpA	431161.2	3.219533	635,701.00	3.227617	68	50 - 150	-0.0081	+/-0.50	
M8PFOA	400159.3	3.485883	615,023.00	3.493867	65	50 - 150	-0.0080	+/-0.50	
M8PFOS	56686.35	3.668117	80,318.00	3.6761	71	50 - 150	-0.0080	+/-0.50	
M9PFNA	305488.1	3.66915	485,671.00	3.677133	63	50 - 150	-0.0080	+/-0.50	
MPFDoA	247257.5	4.096633	427,448.00	4.104617	58	50 - 150	-0.0080	+/-0.50	
D5-NEtFOSAA	56491.46	3.969483	101,283.00	3.977467	56	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	59627.53	3.8977	100,758.00	3.8977	59	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 (B338660-BLK1)			Lab File ID: B338660-BLK1.d			Analyzed: 05/09/23 23:37			
M8FOSA	210729.3	4.04455	238,694.00	4.044533	88	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	63766.36	2.529683	61,329.00	2.537883	104	50 - 150	-0.0082	+/-0.50	
M2PFTA	581946.3	4.305367	471,133.00	4.313416	124	50 - 150	-0.0080	+/-0.50	
M2-8:2FTS	119282.3	3.802817	40,150.00	3.8028	297	50 - 150	0.0000	+/-0.50	*
MPFBA	538233.9	1.0917	442,652.00	1.091717	122	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	155944.7	2.87205	119,328.00	2.872033	131	50 - 150	0.0000	+/-0.50	
M6PFDA	501008.7	3.803333	393,323.00	3.803317	127	50 - 150	0.0000	+/-0.50	
M3PFBS	154948.8	1.9364	127,633.00	1.9364	121	50 - 150	0.0000	+/-0.50	
M7PFUnA	409940	3.93805	368,504.00	3.946033	111	50 - 150	-0.0080	+/-0.50	
M2-6:2FTS	37114	3.461433	32,535.00	3.461417	114	50 - 150	0.0000	+/-0.50	
M5PFPeA	440665.6	1.749417	345,458.00	1.749417	128	50 - 150	0.0000	+/-0.50	
M5PFHxA	735855.3	2.621617	570,567.00	2.621617	129	50 - 150	0.0000	+/-0.50	
M3PFHxS	113916.6	3.2345	89,083.00	3.2345	128	50 - 150	0.0000	+/-0.50	
M4PFHpA	737722	3.2031	587,200.00	3.203083	126	50 - 150	0.0000	+/-0.50	
M8PFOA	739671.8	3.469933	536,603.00	3.469917	138	50 - 150	0.0000	+/-0.50	
M8PFOS	85184.84	3.652167	67,719.00	3.65215	126	50 - 150	0.0000	+/-0.50	
M9PFNA	534701.1	3.653217	375,001.00	3.6532	143	50 - 150	0.0000	+/-0.50	
MPFDoA	367040.5	4.072683	347,389.00	4.072667	106	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	94736.98	3.945533	86,761.00	3.9535	109	50 - 150	-0.0080	+/-0.50	
D3-NMeFOSAA	131711.9	3.873783	94,164.00	3.88175	140	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 (B338660-BS1) Lab File ID: B338660-BS1.d Analyzed: 05/09/23 23:30									
M8FOSA	219420.4	4.04455	238,694.00	4.044533	92	50 - 150	0.0000	+/-0.50	
M2-4:2FTS	61589.61	2.537883	61,329.00	2.537883	100	50 - 150	0.0000	+/-0.50	
M2PFTA	599966.2	4.305367	471,133.00	4.313416	127	50 - 150	-0.0080	+/-0.50	
M2-8:2FTS	83156.71	3.802817	40,150.00	3.8028	207	50 - 150	0.0000	+/-0.50	*
MPFBA	532301.6	1.0917	442,652.00	1.091717	120	50 - 150	0.0000	+/-0.50	
M3HFPO-DA	135786.5	2.87205	119,328.00	2.872033	114	50 - 150	0.0000	+/-0.50	
M6PFDA	487554.9	3.803333	393,323.00	3.803317	124	50 - 150	0.0000	+/-0.50	
M3PFBS	150661.8	1.9364	127,633.00	1.9364	118	50 - 150	0.0000	+/-0.50	
M7PFUnA	431562.1	3.94605	368,504.00	3.946033	117	50 - 150	0.0000	+/-0.50	
M2-6:2FTS	37553.59	3.461433	32,535.00	3.461417	115	50 - 150	0.0000	+/-0.50	
M5PFPeA	437296.4	1.749417	345,458.00	1.749417	127	50 - 150	0.0000	+/-0.50	
M5PFHxA	735579.7	2.621617	570,567.00	2.621617	129	50 - 150	0.0000	+/-0.50	
M3PFHxS	110111	3.234517	89,083.00	3.2345	124	50 - 150	0.0000	+/-0.50	
M4PFHpA	752012.1	3.2031	587,200.00	3.203083	128	50 - 150	0.0000	+/-0.50	
M8PFOA	736639.7	3.469933	536,603.00	3.469917	137	50 - 150	0.0000	+/-0.50	
M8PFOS	82989.96	3.652167	67,719.00	3.65215	123	50 - 150	0.0000	+/-0.50	
M9PFNA	529863.1	3.653217	375,001.00	3.6532	141	50 - 150	0.0000	+/-0.50	
MPFDoA	357940	4.072683	347,389.00	4.072667	103	50 - 150	0.0000	+/-0.50	
D5-NEtFOSAA	98956.26	3.953517	86,761.00	3.9535	114	50 - 150	0.0000	+/-0.50	
D3-NMeFOSAA	120884.4	3.873783	94,164.00	3.88175	128	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
Perfluorobutanesulfonic acid (PFBS)	NH-P
Perfluoropentanoic acid (PFPeA)	NH-P
Perfluorohexanoic acid (PFHxA)	NH-P
11Cl-PF3OUdS (F53B Major)	NH-P
9Cl-PF3ONS (F53B Minor)	NH-P
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	NH-P
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P
8:2 Fluorotelomersulfonic acid (8:2FTS A)	NH-P
Perfluorodecanoic acid (PFDA)	NH-P
Perfluorododecanoic acid (PFDoA)	NH-P
Perfluoro(2-ethoxyethane)sulfonic acid (PFEEESA)	NH-P
Perfluoroheptanesulfonic acid (PFHpS)	NH-P
N-EtFOSAA (NEtFOSAA)	NH-P
N-MeFOSAA (NMeFOSAA)	NH-P
Perfluorotetradecanoic acid (PFTA)	NH-P
Perfluorotridecanoic acid (PFTrDA)	NH-P
4:2 Fluorotelomersulfonic acid (4:2FTS A)	NH-P
Perfluorodecanesulfonic acid (PFDS)	NH-P
Perfluorooctanesulfonamide (FOSA)	NH-P
Perfluorononanesulfonic acid (PFNS)	NH-P
Perfluoro-1-hexanesulfonamide (FHxSA)	NH-P
Perfluoro-1-butanedisulfonamide (FBSA)	NH-P
Perfluorohexanesulfonic acid (PFHxS)	NH-P
Perfluoro-4-oxapentanoic acid (PFMPA)	NH-P
Perfluoro-5-oxahexanoic acid (PFMBA)	NH-P
6:2 Fluorotelomersulfonic acid (6:2FTS A)	NH-P
Perfluoropentanesulfonic acid (PFPeS)	NH-P
Perfluoroundecanoic acid (PFUnA)	NH-P
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	NH-P
Perfluoroheptanoic acid (PFHpA)	NH-P
Perfluorooctanoic acid (PFOA)	NH-P
Perfluorooctanesulfonic acid (PFOS)	NH-P
Perfluorononanoic acid (PFNA)	NH-P

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

2300977



Phone: 413-525-2332
Fax: 413-525-6405
Email: info@contestlabs.com

Company Name: Barnstable County
Address: 3195 Main St. PO Box 427

Phone: BFTA

Project Location: Barnstable, MA

Project Number: 6206

Project Manager: Roger Thibault

Con-Test Quote Name/Number:

Invoice Recipient: Priscilla Ellis - pellis@barnstablecounty.org

Sampled By: Chris Olen

39 Spruce Street
East Longmeadow, MA 01028

CHAIN OF CUSTODY RECORD

Doc # 381 Rev 2_06262019

Page 1 of 2

ANALYSIS REQUESTED

7 Day ☐ 10 Day ☐ Field Filtered ☐
PFAS 15 Day (std) ☒ Due Date:
1 Day ☐ 3 Day ☐ Field Filtered ☐
2 Day ☐ 4 Day ☐ Lab to Filter ☐

Format: PDF ☒ EXCEL ☒
Other:
CLP Like Data Pkg Required: ☐

SOXHLET ☐
NON SOXHLET ☐

PCB ONLY ☐

ENCORE ☐

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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	PC-39	4.4.23 10:30	4.4.23 10:30	GRAB	GW	H						X
2	PFW-1	4.4.23 13:30	4.4.23 13:30	GRAB	GW	H						X
3	PFW-5	4.4.23 12:30	4.4.23 12:30	GRAB	GW	H						X
4	PC-28	4.4.23 9:00	4.4.23 9:00	GRAB	GW	H						X
5	OW-8A	4.4.23 13:00	4.4.23 13:00	GRAB	GW	M-H						X
6	PFW-2	4.4.23 1:50pm	4.4.23 1:50pm	GRAB	GW	H						X
7	EB-4.4.23	4.4.23 14:00	4.4.23 14:00	GRAB	GW	L						X
8	EB-4.5.23	4.5.23 14:00	4.5.23 14:00	GRAB	GW	L						X
9	MW-12S	4.5.23 12:50	4.5.23 12:50	GRAB	GW	H						X
10	PC-39 MS/MSD	4.4.23 10:30	4.4.23 10:30	GRAB	GW	H						X

1 Preservation Code:
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)

1 Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

1 Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

1 Matrix Codes:
GW = Ground Water
WW = Waste Water
DW = Drinking Water
A = Air
S = Soil
SL = Sludge
SOL = Solid
O = Other (please define)

Client Comments: Sample confirmation and report to Rthibault@BETA-Inc.com & Lboulley@BETA-Inc.com. MS/MSD provided to laboratory at their request.

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Lab Comments:
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.

KAF

Historic Laboratory Results for Quarterly Sampling April 2023

These data, these results, and historic results provided by Pare or another accredited laboratory, these results are for informational purposes only and do not reflect actual results of what may be in April 2023 sample.

[illegible]

39 Spruce St.
East Longmeadow, MA. 01028
P: 413-525-2332
F: 413-525-6405
www.pacelabs.com

ENV-FRM-ELON-0009V02 Sample Receiving Checklist 1-12-2023

Log In Back-Sheet

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



Client Barnstable County
Project DETA
MCP/RCP Required MA MCP
Deliverable Package Req. GW-1
Location Barnstable, MA
PWSID# (When Applicable) _____
Arrival Method:
Courier ☒ Fed Ex ☐ Walk In ☐ Other ☐
Received By / Date / Time MM 4-7-23 18:15
Back-Sheet By / Date / Time CH 4-10-23 12:16
Temperature Method GIN # 3
Temp ☒ < 6° C Actual Temperature 2.6
Rush Samples: Yes / No Notify
Short Hold: Yes / No Notify

Notes regarding Samples/COC outside of SOP:

	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> ☐ ☐		

Container (Circle when applicable)	UnP	HCl	HNO3	H2SO4	NaOH	Trizma	Na2S2O3	Other Preservative
1L Amber Plastic								
500 mL Amber Plastic								
250 mL Amber Plastic	30							
Other Amber Clear Plastic								
16oz Amber Clear								
8oz Amber Clear								
4oz Amber Clear								
2oz Amber Clear								
Col/Bacteria								
Flashpoint								
Plastic Bag								
SOC Kit								
Perchlorate								
Encore								
Frozen								
Proper Headspace	UnP	HCl	MeOH	Bisulfate	DI	Thiosulfate	Sulfuric	Other
Vials								

APPENDIX D

PUBLIC NOTIFICATIONS



August 30, 2023

Mark S. Ells, Town Manager
Town of Barnstable
200 Main Street
Hyannis, MA 02601

RE: Immediate Response Action Status and Remedial Monitoring Report #65
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. 65 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 January 2023 to June 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 January 2023 to June 2023 reporting period, two treatment systems, GWTS #1 and GWTS#2, were in operation for all of the 6-month period. The primary treatment system (GWTS #1) and secondary system (GWTS #2) were in operation for approximately 181 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 4.6 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 are included in the IRA Status and RMR No. 65 report document.

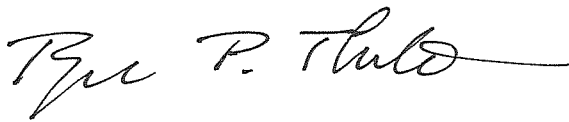
Change in Procedure for Filing Status Reports

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. 65 document is the third 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

GENERATOR

INT'L

TRANSPORTER

DESIGNATED FACILITY

DESIGNATED FACILITY TO GENERATOR

NON-HAZARDOUS
WASTE MANIFEST

1. Generator ID Number

NON E

2. Page 1 of

1

3. Emergency Response Phone

(800) 839-3975

4. Waste Tracking Number

0254059

5. Generator's Name and Mailing Address

BARNSTABLE COUNTY
ACCOUNTS PAYABLE
3195 MAIN STREET, PO BOX 427
BARNSTABLE, MA 02630

Generator's Site Address (if different than mailing address)

FIRE & RESCUE TRAINING ACADEMY
155 S. FLINT ROCK ROAD
BARNSTABLE, MA 02630

Generator's Phone:

(508) 362-3828

6. Transporter 1 Company Name

EQ NORTHEAST, INC.

U.S. EPA ID Number

MAD 084 814 136

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address

WAYNE DISPOSAL, INC. SITE #2 LANDFI
49350 N I-94 SERVICE DRIVE
BELLEVILLE, MI 48111

U.S. EPA ID Number

MID 048 090 633

Facility's Phone:

(800) 592-5489

9. Waste Shipping Name and Description

10. Containers

No.

Type

11. Total
Quantity12. Unit
Wt./Vol.

1. Non Hazardous Solid Waste, Not DOT Not RCRA Regulated

8

GM
Am

1600

P

2.

3.

4.

13. Special Handling Instructions and Additional Information

1. F210041WDI / SPENT FILTER BAGS [W:15.00.14160300]

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offor's Printed/Typed Name

Signature

Month Day Year

X PAUL RUSZALA

X [Signature]

1 23 23

15. International Shipments

☐ Import to U.S.☐ Export from U.S.

Port of entry/exit:

Date leaving U.S.:

Transporter Signature (for exports only):

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name

Signature

Month Day Year

James B. Hutchins

[Signature]

1 23 23

Transporter 2 Printed/Typed Name

Signature

Month Day Year

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

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name

Signature

Month Day Year

Amber Jerome

[Signature]

2 14 23

CERTIFICATE OF DISPOSAL



This certificate is to verify the wastes specified on Manifest # 0254059

have been properly disposed of in accordance with all local, state and federal regulation.

"Disposed of" means either: 1) Burial or 2) Processed as specified in 40CFR et sea.

FACILITY NAME:
(Please check one)

☐ Michigan Disposal Waste Treatment Plant
(EPA I.D. # MID000724831)

☒ Wayne Disposal, Inc.
(EPA I.D. # MID0048090633)

ADDRESS:

49350 N. I-94 Service Drive
Bellville, Michigan 48111

PHONE NUMBER:

1-800-592-5489

FAX NUMBER:

1-800-593-5329

Authorized Signature: _____

A handwritten signature in black ink, consisting of a stylized 'A' with a large loop.

2301842844

40406

Please print or type. (If unit designated for use on site (12 plain typewriter).)

NON-HAZARDOUS WASTE MANIFEST		1. Generator ID Number NONEREQUIRED	2. Page 1 of 1	3. Emergency Response Phone (800) 483-3718	4. Waste Tracking Number 04102023 DB	
5. Generator's Name and Mailing Address Barnstable County 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			
6. Transporter 1 Company Name Cym Oil Corporation			U.S. EPA ID Number MAD082303777			
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 MAD053452687			
Facility's Phone: (781) 380-7100			10. Containers		11. Total Quantity	12. Unit Wt./Vol.
9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))		No.	Type		
1	NON DOT REGULATED MATERIAL, (PFAS REMEDIATION WASTEWATER)		001	TT	300	g
2						
3						
4						
13. Special Handling Instructions and Additional Information 1. CH2543327B						
Contract retained by generator confers 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 RUSZALA			Signature <i>[Signature]</i>		Month 09	Day 10
☒ International Shipments ☐ Import to U.S. ☐ Export from U.S.			Port of entry/exit: Date leaving U.S.:		Year 20	
16. Transporter Acknowledgment of Receipt of Materials						
Transporter 1 Printed/Typed Name DANIEL BALLARGEY			Signature <i>[Signature]</i>		Month 09	Day 10
Transporter 2 Printed/Typed Name			Signature		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 4						
Day 10						
Year 23						
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in item 17c						
Printed/Typed Name Huyen Hoang			Signature <i>[Signature]</i>		Month 4	Day 10
					Year 23	

6-NHM-C-C-11

Clean Harbors has the appropriate permits for and will accept the waste the generator is shipping.

1-DESIGNATED FACILITY TO DESTINATION