

PFAS Release
Groton-Dunstable Regional High School
703 Chicopee Row
Groton, Massachusetts
RTN 2-21961

IMMEDIATE RESPONSE ACTION PLAN

Groton-Dunstable Regional School District
April 2023

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Section 1

Site Background

On behalf of the Groton-Dunstable Regional School District (the District), Tighe & Bond has prepared this Immediate Response Action (IRA) Plan in response to the detection of per- and polyfluoroalkyl substances (collectively known as PFAS) in soil and groundwater at the Groton-Dunstable Regional High School ("GDRHS" or "the school") located at 703 Chicopee Row in Groton, Massachusetts ("the Site"). This report has been prepared in accordance with 310 CMR 40.0424 of the Massachusetts Contingency Plan (MCP), and the requirements of the Notice of Responsibility (NOR) issued to the District by the Massachusetts Department of Environmental Protection (MassDEP) on March 2, 2023. A Release Notification Form (RNF, BWSC-103) and an IRA transmittal form (BWSC-105) are being submitted concurrently with this report under Release Tracking Number (RTN) 2-21961.

This report describes assessment activities completed to date and planned immediate response actions to mitigate exposures to PFAS at the Site and downgradient residential properties with potable drinking water wells. A Site Location map, a Priority Resources map showing sensitive environmental receptors in the area, and an Aerial Radius Map are provided as Figures 1 through 3, respectively, in Appendix A.

The current responsible party for the Site is identified by MassDEP as the Groton-Dunstable Regional School District. The contact person for the District is:

Dr. Laura Chesson, Superintendent
Groton-Dunstable Regional School District
703 Chicopee Row
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Tighe & Bond is performing response actions at the Site on behalf of the District. The Licensed Site Professional (LSP) coordinating response actions for the release under RTN 2-21961 is:

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1.1 Release History

In 2003, during construction of a running track, it was reported that the stockpiled rubber track material had caught fire. According to the August 14, 2003 Response Action Outcome (RAO) submitted by C.R. Klewin Northeast, LLC for RTN 2-14807, the Groton Fire Department reportedly used aqueous-film-forming foam (AFFF) to extinguish the fire. Based on the available information, MassDEP has determined that the application of AFFF has resulted in PFAS soil and groundwater contamination at the school, the school's potable well, and potable wells to the north and east of the Site.

In the August 2003 RAO Statement, it was reported that the AFFF was used within 1,000 feet of the GDRHS public water supply well operated at the school. While PFAS was not regulated at the time of the fire, a potential release to the environment from the track materials (resin, binder, etc.) was evaluated under the MCP. A shallow excavation was advanced in the location of the fire to remove the residual track materials and a Class A-2 RAO was submitted for the release (now equivalent to a Permanent Solution Statement in the MCP). Based on recent MassDEP concern for mitigating public water supply wells impacted by PFAS, MassDEP required PFAS testing of the school supply well. The supply well was tested for PFAS in March 2022, which indicated PFAS were present at a concentration of 490 nanograms per liter (ng/L), which exceeds the Massachusetts Maximum Contaminant Level (MMCL) of 20 ng/L for the sum of the six PFAS compounds regulated by MassDEP (PFAS6). PFAS6 include the following compounds:

- Perfluorooctanesulfonic acid (PFOS)
- Perfluorooctanoic acid (PFOA)
- Perfluoroheptanoic acid (PFHpA)
- Perfluorodecanoic acid (PFDA)
- Perfluorohexanesulfonic acid (PFHxS)
- Perfluorononanoic acid (PFNA)

MassDEP subsequently issued an NOR to the construction contractor, C.R. Klewin Northeast, LLC (now defunct), and more recently to the District as owner, for addressing PFAS at the Site. In the original NOR, MassDEP indicates a Condition of Substantial Release Migration (SRM) likely occurred from the use of AFFF at the Site, whereby PFAS has migrated in groundwater from the source area at the school to nearby residences, which use the groundwater as potable water. MassDEP initiated sampling of the private wells at residences assumed to be located hydrologically downgradient of the fire (along Kemp and Groton Streets), which indicated PFAS6 concentrations exceeded regulatory standards in select private well samples (see Section 2). In the NOR issued to the District for RTN 2-21961, MassDEP required the submittal of this IRA Plan on or before April 1, 2023, which must include the following:

- (NOR Item 1)** Submittal to MassDEP of a completed Release Notification Form (BWSC-103).
- (NOR Item 2)** Iterative identification and sampling of all public or private drinking water wells located:
- Within 500 feet of any drinking water well where PFAS6 is detected (at any concentration).
 - Within 500 feet of any groundwater monitoring well where PFAS6 is detected above 20 ng/L.
 - Within 500 feet of irrigated areas of the Site.
- (NOR Item 3)** Immediate provision of bottled water (or treatment) for any pre-school, school, occupied residence, or daycare (considered a Critical Exposure Pathway, CEP) with wells having detectable levels of PFAS6 related to the Site. Bottled water must be provided until it can be

confirmed the POET system is effectively eliminating PFAS in the POET effluent to non-detect concentrations.

- (NOR Item 4)** Immediately make arrangements to install a POET for any private drinking water well with concentrations of PFAS6 at or above 20 ng/L (currently, 252 and 286 Kemp Street).
- (NOR Item 5)** Maintain the existing and future POET systems, and provide a monitoring schedule.
- (NOR Item 6)** Measures to address CEPs immediately, upon obtaining knowledge of the condition.
- (NOR Item 7)** Measures for addressing non-CEP drinking water exposures that constitute a Condition of SRM (e.g., commercial private wells) and an implementation schedule.
- (NOR Item 8)** A monitoring schedule for public and private drinking water wells with Site-related PFAS6 concentrations below 20 ng/L.
- (NOR Item 9)** Specific plans and a defined schedule to address soil, surface water and groundwater at the Site, and implement response actions necessary to control the source and contaminant migration from the Site.

1.2 Site Conditions and Conceptual Site Model

As shown on Figure 1, the Site is located on a plateau bordered by wetlands to the west, north and east, with a gentle gradient to the northeast, toward Unkety Brook, which is the presumed groundwater flow direction.

The source of the PFAS is believed to be the AFFF used to extinguish a fire involving staged running track materials during construction (shredded rubber tire and binder). The 2003 RAO boundary where the fire occurred, as well as the track encompassing the school football field, and the remainder of the GDRHS campus are shown on the Site Plans, provided as Figures 3 and 4 in Appendix A. The school supply well (the supply well), located northeast of the source area, is depicted on Figure 4. Water sampled from this well has approximately 500 ng/L of PFAS.

The supply well was installed in late 2001 to provide water for the school. The supply well is a 45-foot deep, gravel-packed well with a 12 horsepower, 100 gallons-per-minute (gpm) submersible turbine pump that conveys groundwater for treatment at 64 gpm. Water is conveyed to the team sports building that houses a water treatment plant (located southeast of the tennis courts, between the high school building and the football field – see Figure 4). Water flows into the team sports building and is either directed to a 3,000-gallon tank under the building or goes to the drinking water treatment system. Water in the underground tank is used for irrigation and fire protection, and all water not diverted to this tank passes through the treatment system.

The drinking water treatment system begins with two water softeners in parallel for iron and manganese removal, followed by three anion exchange units in parallel, each with

tanex resin for color removal. Water is metered and treated with soda ash for pH control and a phosphate for corrosion control, and then disinfected by ultraviolet (UV) light. The drinking water treatment system evidently provides some PFAS treatment (potentially through the anion-exchange resin) since the system effluent contains approximately 50 ng/L of PFAS.

The private well sampling conducted by MassDEP at 15 residences along Kemp and Groton Streets in May 2022 suggests the PFAS plume from the Site extends northeast to these residences.

Untreated PFAS-containing well water from the supply well (approximately 500 ng/L) has been used to irrigate the athletic fields and other areas of the school, presumably since 2003 when the school was constructed. It is assumed that this irrigation activity has distributed PFAS to irrigated areas of the school campus. Six athletic fields are currently used at the Site, which have been irrigated with untreated supply well water. The athletic fields (football field/track, girls field hockey, former softball diamond, softball field, practice field, boys varsity soccer/girls lacrosse field, and baseball field) are shown on Figure 4.

Surficial soil sampling at the six athletic fields was performed in October 2022 and January 2023, to assess the impact of the supply well irrigation water and evaluate the potential risk to human health from exposure to soil in the fields. Based on the laboratory results, PFAS6 are present in surficial soils (0-6") at concentrations exceeding the Method 1 S-1/GW-1 standards (see Section 3), in the range of 1 to 12 micrograms per kilogram ($\mu\text{g}/\text{kg}$).

Surficial geology at the Site is mapped as glacial coarse deposits in the topographically high areas, and as swamp deposits in topographically low areas, with thin till and some bedrock outcrops mapped to the northwest.

1.3 Surrounding Receptors

The release Site is depicted on the Massachusetts Bureau of Geographic Information (MassGIS) Priority Resource mapping (Figure 2, Appendix A). The supply well that services the school is shown as a Non-Community, Non-Transient Public Water Supply, and is surrounded by a MassDEP Approved Wellhead Protection Area and MassDEP Interim Wellhead Protection Area (IWPA), which extend 500 feet and 0.5 miles beyond the supply well, respectively (pink hatching). The Site is also partially located within a Potentially Productive Medium Yield Aquifer. Portions of the Site are mapped within an Area of Critical Environmental Concern (purple hatching), Natural Heritage and Endangered Species Program (NHESP) Priority Habitats for Rare Species and Estimated Habitats for Rare Wildlife, and MassDEP identified Inland Wetlands. Additional resources mapped within 0.5 miles of the Site include NHESP Certified and Potential Vernal Pools to the northeast. Unkety Brook is the nearest surface water body to the Site, which is located approximately one-half mile to the southeast.

1.4 Groundwater and Soil Classification

In accordance with 310 CMR 40.0933, soil at the Site is categorized based on current and future potential receptors, frequency of use, intensity of use/activities, and accessibility of the soil to receptors. Under current site conditions, the frequency of use for adults and

children is characterized as “high” because the Site is used as a high school where these populations are regularly present. The intensity of use is characterized as “low” for adults and children under current site use. PFAS is present in surficial soil (upper 6 inches) in unpaved areas; therefore, soil is considered “accessible.” Based on this information, Soil Category S-1 is applicable under current and future site conditions.

Groundwater at disposal sites is characterized as one or more of three possible categories pursuant to 310 CMR 40.0932.

- GW-1: Groundwater at a disposal site that is located within a Current or Potential Drinking Water Source Area.
- GW-2: Groundwater located within 30 feet of an existing or planned building where annual average depth to groundwater is less than 15 feet below grade (bg)
- GW-3: Groundwater at all disposal sites shall be categorized as GW-3.

The Site is located within a Current Drinking Water Source Area (Section 1.3), and the depth to groundwater may be less than 15 feet bg within 30 lateral feet of the buildings located at the Site. Based on this information, the GW-1 and GW-3 Groundwater Categories apply to groundwater beneath the Site. The GW-2 category applies to groundwater within 30 feet of an occupied building, though PFAS are not volatile and therefore do not present a risk of vapor intrusion into overlying buildings (there are no GW-2 standards developed for PFAS).

Section 2

MassDEP Response Activities

Based on the results of the supply well sample collected on March 1, 2022, indicating a PFAS6 concentration of 490 ng/L, MassDEP identified the potential for a Condition of SRM that could result in PFAS impacts to nearby residential private wells. During the period of May through October 2022, MassDEP contractors collected drinking water samples from 15 residential private wells located along Kemp and Groton Streets in Dunstable for PFAS analysis, which were presumed to be located hydrologically downgradient of the supply well. The locations sampled and their corresponding PFAS6 concentrations are provided in Table 2-1 below:

Table 2-1
MassDEP-PFAS Sampling Results

Residence	PFAS6 (ng/L)	Residence	PFAS6 (ng/L)
232 Kemp Street	ND	286 Kemp Street	45
235 Kemp Street	ND	290 Kemp Street	5.9
252 Kemp Street	37	655 Groton Street	2.1
259 Kemp Street	4.2	670 Groton Street	9.7
271 Kemp Street	ND	690 Groton Street	4.3
273 Kemp Street	ND	700 Groton Street	ND
274 Kemp Street	123	710 Groton Street	ND
285 Kemp Street	ND		

ND – PFAS6 not detected above laboratory reporting limits
Bolded results exceed 20 ng/L

As shown in Table 2-1, samples collected from 252 Kemp Street, 274 Kemp Street and 286 Kemp Street contained PFAS6 at concentrations exceeding the 20 ng/L MMCL, with 274 Kemp Street containing PFAS above the Imminent Hazard threshold of 90 ng/L for PFAS6. Based on the Imminent Hazard condition, a point-of-entry treatment (POET) system was installed at the 274 Kemp Street residence in June 2022. POET monitoring at 274 Kemp Street, conducted at the direction of MassDEP in July, August, and October 2022, indicate that the POET system is effectively removing PFAS from drinking water, as PFAS6 was not detected in the effluent samples.

A PFAS6 Radius Map (Figure 3) showing private well locations and their respective PFAS6 compliance status is included in Appendix A for reference. A complete summary of potable well results is presented in Table 2, included in Appendix B.

Section 3

Soil Assessment Activities

3.1 Football Field Pre-characterization

In preparation for improvements to the football field, which is in a deteriorated state, Tighe & Bond was contracted by the District to collect pre-characterization samples. Specifically, the District was planning removal of the top 6 inches of soil on the football field and replacement with new topsoil. On October 4, 2022, Tighe & Bond collected 18 surficial composite soil samples (S-1 through S-18) from the football field. Given the historical use of AFFF at the Site, the samples were submitted for PFAS analysis. Three of the samples were also submitted for standard landfill disposal acceptance parameters.

As part of the pre-characterization sampling program, the football field was divided into a grid of 18 approximately equal sections, with four aliquots collected from each section combined into a single composite sample. The samples were collected using hand tools, which were decontaminated with Alconox soap mixed with PFAS-free water, and then rinsed using PFAS-free water, prior to collecting each sample. The composite samples were submitted to Alpha Analytical, Inc. of Westborough, Massachusetts (Alpha) for PFAS analysis by isotope dilution.

The aliquot sample locations are depicted on Figure 4 – Surficial Soil Sample Locations provided in Appendix A, and the analytical results are summarized in Table 1 – Soil Analytical Results, in Appendix B. As shown in Table 1, one or more PFAS6 were detected in the top 6 inches of soil in the football field, in each composite sample, with at least one PFAS compound exceeding its Method 1 S-1/GW-1 standard in each sample.

3.2 Athletic Fields Surficial Soil Assessment

Based on the football field surficial soil results, an expanded surficial soil sampling program was developed to assess the additional five athletic fields and characterize potential risk posed to student athletes using the various fields. Further, the additional sampling was developed to further inform how use of the irrigation system has distributed PFAS at the campus.

Tighe & Bond visited the school on December 12, 2022 and met with District personnel to observe irrigation water flow dynamics on and around the athletic fields, to identify potential areas which were irrigated using water containing PFAS. Several types of areas were identified during the Site visit (high-lying areas, low-lying areas, stormwater infrastructure areas designed to contain surface runoff, and an area where a sprinkler head had been damaged). The areas identified during the Site visit, as well as areas designated for general spatial coverage, are shaded on Figure 4.

On January 30 and 31, 2023, Tighe & Bond collected composite surficial soil samples from the five additional athletic fields. Seventeen composite soil samples, S-19 through S-35, were collected as part of this sampling event. The samples were collected using the same protocol as the football field samples, though a less-dense sampling frequency was employed given the large subject area. Four soil aliquots were collected from each of the shaded areas depicted on Figure 4, from 0 to 6 inches bg, and combined into a single

composite sample. The samples were submitted to Alpha for PFAS analysis by isotope dilution. Copies of the laboratory reports are provided in Appendix D.

3.2.1 Athletic Fields Surficial Soil Analytical Results

The sample results from each athletic field (including the football field) are summarized in Table 1. To characterize potential risk of harm to student athletes, exposure point concentrations (EPCs, or the arithmetic mean) were developed for each detected PFAS6 compound, as shown in Table 1 (for non-detect results, one-half the reporting limit was included in the EPC calculation). The EPC column in Table 1 indicates that the EPC for PFOS (5.42 µg/kg) exceeds the Method 1 S-1/GW-1 Standard of 2 µg/kg. The other EPCs do not exceed their respective S-1/GW-1 standards. As shown in Table 1, all of the PFAS6 EPCs are well below the MCP Method 2 Direct Contact values.

3.2.2 Method 2 Direct Contact Standards Evaluation

While the Method 1 soil standards consider risk from direct contact with the soil and risk to underlying groundwater, the Method 2 standards consider risk from ingestion of, and direct contact with, soil only. As shown in Table 1, sample results for samples S-1 through S-35 are below the Method 2 Direct-Contact Standards for PFAS [300 µg/kg; equivalent to parts per billion (ppb)]. The MassDEP Method 2 Direct-Contact Standards can be used to determine whether direct contact with contaminated soils (independent of potential groundwater exposure) is likely to pose a significant risk to human health. Comparison of the S-1 through S-35 soil sample results to the MassDEP Method 2 Direct-Contact Standards indicates that direct contact with the fields does not pose a significant risk to human health.

To confirm the Method 2 Direct-Contact Standards are sufficiently protective, Tighe & Bond contracted with a third-party risk assessor (Sovereign Consulting, Inc. of Foxborough, Massachusetts – “Sovereign”) to further evaluate the Method 2 Direct-Contact Standards, incorporating exposure from soil dust inhalation, such as that which could result from athletic use of the fields (the Method 2 Direct-Contact Standards do not specifically include potential impacts to human health through an inhalation pathway). Sovereign also increased the intensity of soil exposure to conservatively reflect more intense contact with soil expected during sports, as opposed to passive use of the property (higher potential soil ingestion rates, soil dermal absorption (through skin), and soil particle concentrations in air). The exposure assumptions used by Sovereign to reflect athletes’ exposure to athletic fields soil are detailed in the Sovereign report provided in Appendix C.

To confirm the Method 2 Standards are sufficiently protective, Sovereign first applied a hypothetical PFAS soil concentration of 100 ppb for each of the PFAS6 compounds. Sovereign then calculated non-carcinogenic Hazard Indices (HI) using the hypothetical PFAS6 levels (100 ppb) for each individual PFAS6 compound. The HI was calculated for children (most vulnerable), youth, and adults (least vulnerable) using increased exposure assumptions to represent exposure associated with sports field activities. Sovereign then used the Child HI (most protective) to back-calculate maximum acceptable soil Action Levels (AL) based on a target HI of 0.2. An HI of 0.2 is the same level of protectiveness provided by MassDEP Method 1 standards. The calculations were performed using toxicity standards and risk assessment methodology promulgated by MassDEP. The maximum acceptable AL was 300 ppb for each PFAS6 compound (consistent with the Method 2 Direct Contact Standards), confirming that level represents the maximum concentration each PFAS6 compound can exist in the athletic fields without posing significant risk to sports

field users (child, youth and adults). The calculations also confirm that potential inhalation of soil particles is not a significant exposure pathway for PFAS6 with regard to athletics.

The ALs calculated by Sovereign (0.3 mg/kg; equivalent to 300 µg/kg and 300 ppb) are presented in the in-text table included within the attached Sovereign report (p.2) in Appendix C. As indicated at the bottom of page 2 in the Sovereign report, the HIs for each of the PFAS6 compounds at a hypothetical concentration of 300 ppb yields a cumulative HI of 1.2, which is "...slightly above, but consistent with, a maximum acceptable HI of 1.0" (Sovereign, p. 2). The ALs calculated by Sovereign, which are consistent with the Method 2 Direct Contact Standards of 300 ppb for each individual PFAS6, are provided in Table 1 (Appendix B).

As shown in Table 1, the PFAS6 concentrations detected across the six athletic fields at the Groton-Dunstable Regional High School campus are well below the 300 ppb Soil Action Levels, indicating that the PFAS in soil do not represent a Significant Risk or Hazard to the users of these fields.

Tighe & Bond drafted a letter summarizing the athletic field sample results and application of the MassDEP Method 1 and Method 2 standards, as well as the Sovereign Soil Action Levels, to distribute to the public at the District's convenience. The letter "Athletic Fields Surficial Soil Results" dated March 28, 2023 is provided in Appendix C, along with the Sovereign Report.

Section 4

Immediate Response Action Plan

4.1 NOR Item 2 – Expansion of Sample Radius

Based on the initial sample results from MassDEP’s sampling efforts, the sampling radius is being extended by 500 feet from any location with a confirmed PFAS detection. The locations included in the new radius include the following properties:

- 125 and 148 Adams Street
- 174, 192, 197, 212, 215, 219 and 249 Kemp Street
- 19, 20 and 30 Kristen Lane
- 617, 626, 629, 636, 641, 644, 660, 665 and 678 Groton Street

In addition to the new properties referenced above, the properties listed in Table 2-1 (Section 2) previously sampled by MassDEP will be sampled again for monitoring purposes. The properties included in the new sample radii are shown on the PFAS6 Radius Map (Figure 3) included in Appendix A for reference.

4.1.1 Additional Properties

The NOR specifically requests sampling of private wells within 500 feet of irrigated areas at the Site, which includes the recreational fields at the school. Residences with private wells within 500 feet of irrigated areas are limited to the area of the baseball field near Chicopee Row and include the following properties:

- 691, 701, 711 and 731 Chicopee Row

It is noted that the radii may require expansion based on the PFAS6 analytical results obtained from the properties referenced above, until unimpacted wells are identified.

4.1.2 Request of Access Letters

On March 20, 2023, Tighe & Bond sent Request for Access Letters to the 41 identified property owners within the 500-foot radius. The letters requested access to collect potable water samples for PFAS analysis, and included the MassDEP PFAS Fact Sheet and a form for the owner to provide information regarding their potable water system. We anticipate that sampling of the above-referenced private wells will be performed in mid-April 2023.

4.2 NOR Item 3 – Bottled Water Provisions

Bottled water will be provided by the District where PFAS6 is detected at any private or public well location within an established 500-foot radius. Bottled water delivery is anticipated to begin in April 2023.

4.3 NOR Items 4 and 5 - POET Installation and Monitoring

POET systems will be required for all locations with PFAS6 exceeding 20 ng/L. Therefore, granular activated carbon (GAC) filter systems will be installed at 252 and 286 Kemp Street, and any other future locations within the sampling radius with PFAS6 concentrations above 20 µg/L.

Tighe & Bond has contacted the owners of 252 and 286 Kemp Street, and a POET installation contractor will be contacting them directly to schedule a visit to identify suitable placement for the system. The contractor will obtain the proper permits from the Town of Dunstable prior to installation, and a licensed plumber will be required to make the final connection to the potable well.

POET systems will consist of two vessels with 2 cubic feet of GAC media (Filtasorb 400 or 600) plumbed in series and a flow meter. Sample ports will be plumbed before (influent), between the two GAC vessels (midfluent), and after the second GAC vessel (effluent) to allow for sample collection and POET monitoring.

Based on our experience at similar sites, Tighe & Bond proposes a monitoring schedule of midfluent and effluent sampling at each newly installed POET within the first month of operation, followed by semi-annual sampling for one year to monitor for contaminant breakthrough of the primary GAC vessel. If PFAS are detected in the midfluent sample, the primary carbon unit will be considered spent. The secondary GAC unit will be moved to the primary position, and the primary canister will be removed for carbon replacement. A unit with fresh GAC will be installed as the new secondary unit, and the spent carbon will be sent for regeneration or disposal. This arrangement maximizes the service life of the secondary-to-primary vessel, and decreases the potential for PFAS to break through the secondary vessel between monitoring events.

The POET systems are equipped with a flow meter that will allow us to track the mass of PFAS removed before breakthrough occurs. Future monitoring schedules will be proposed based on these data, once sufficient data has been collected to develop such a schedule.

274 Kemp Street POET

MassDEP initiated the installation of the POET at 274 Kemp Street to eliminate an Imminent Hazard condition. Subsequent midfluent and effluent sampling indicate that the system is performing as intended. As such, Tighe & Bond will include 274 Kemp Street in the semi-annual monitoring schedule.

4.4 NOR Items 6 and 7 - Exposure Pathways

Tighe & Bond has planned an initial sampling round of 41 private well locations based on the PFAS detections identified by MassDEP. Based on the results of the 41 planned locations, the sample radius will be expanded an additional 500 feet from any location where PFAS6 is detected.

Critical and non-critical exposure pathways will be addressed in the following manner:

- Within 24 hours of receipt of laboratory results, homeowners will be notified by their preferred method, of a PFAS6 detection, and arrangements to deliver bottled water will be made for drinking and cooking purposes.
- Within 24 hours of receipt of laboratory results, homeowners will be notified by their preferred method, of a PFAS6 detection greater than 20 ng/L, and arrangements to deliver bottled water will be made for drinking and cooking purposes until a POET system can be installed.
- For any location with a PFAS6 detection above 20 ng/L, bottled water will be provided until a POET system is installed, and PFAS analysis confirms non-detect results are observed in the midfluent and effluent samples.

4.5 NOR Item 8 - Monitoring Schedule

Tighe & Bond proposes an initial monitoring schedule of semi-annual sampling for all private well locations within the established radii where PFAS6 is detected.

For all locations where POETs are required, we propose collecting midfluent and effluent samples within the first month of operation, and then semi-annually thereafter.

To develop the GAC breakthrough data, the influent at eight to 10 selected homes, representing high and medium influent concentrations, will be sampled annually. Given the length of time since this release occurred, significant temporal variation in influent concentrations is not expected.

4.6 NOR Item 9 - Response Action Schedule

To characterize the extent of PFAS in soil and groundwater at the school, the following assessment activities have been proposed to the District and have either been completed or are underway:

- Shallow composite (combined) soil samples (varying from 0-3' below ground) collected within the football field and in the immediate surrounding area, as well as the five additional athletic fields
- Composite soil sample collection from the raised garden beds in use at the school
- Boring advancement and collection of discrete (single) soil samples at the depth of the water table
- Installation of groundwater monitoring wells at the anticipated source area and downgradient locations
- Collection of groundwater samples from the proposed monitoring wells and the two existing site monitoring wells near the supply well (see Figure 4)
- Survey of new well locations and development of groundwater contour mapping

As described in Section 3, composite surficial soil sampling (0 to 0.5 feet bg) has been performed within the athletic fields at the school, which indicates No Significant Risk to athletes using the fields, based on Method 2 Direct Contact values and a comprehensive risk characterization performed by Sovereign Environmental.

Tighe & Bond subcontracted with a driller to advance soil borings and install shallow groundwater monitoring wells at the Site using a direct-push, rubber-tracked drill rig (Geoprobe) on February 21 and 22, 2023. Monitoring wells were installed within and downgradient (northeast) of the 2003 RAO boundary (Figure 4), with surficial composite soil samples and discrete groundwater-interface soil samples collected at the monitoring well locations. Supplemental borings were also advanced within and in the immediate vicinity of the football field, and shallow composite samples were collected within the football field from 0.5 to 3 feet bg and in the immediate vicinity of the 2003 RAO boundary from 0 to 0.5 feet.

Monitoring wells were attempted immediately south and west of the football field to assess cross-gradient PFAS groundwater concentrations; however, the Geoprobe borings were refused at multiple locations (including offset borings) without encountering a significant overburden aquifer. It is possible the borings were refused due to encountering bedrock. Depth to bedrock will be further evaluating during upcoming drilling activities.

Soil samples were collected from select, refused borings. The soil samples collected on February 21 and 22, 2023 were submitted to Alpha for PFAS analysis by isotope dilution; the data has not been received from the lab at this time. Additional drilling is planned to further assess PFAS groundwater conditions, and Tighe & Bond will propose collection of surface water samples to the District, based on the requirements set forth in the NOR. The assessment results will be reported in detail in future IRA Status Reports, including groundwater and surface water sample results, and a groundwater concentration and elevation contour mapping using PFAS6 groundwater concentrations and surveyed monitoring well rim elevations will be prepared.

Section 5

Conceptual Site Model

The Site is located on a plateau bordered by wetlands to the west, north and east, with a gentle gradient to the northeast, toward Unkety Brook, which is the presumed groundwater flow direction.

The source of the PFAS is believed to be AFFF which was used for firefighting when staged running track materials caught fire during construction of the track (shredded rubber tire and binder). The 2003 RAO boundary where the fire occurred, as well as the track encompassing the school football field, and the remainder of the GDRHS campus are shown on Figure 4 in Appendix A. The school supply well, located northeast of the source area, is also depicted on Figure 4, which had detections of PFAS6 concentrations of approximately 500 ng/L.

Untreated PFAS-containing well water from the supply well (500 ng/L PFAS) has been used to irrigate the athletic fields and other areas of the school, presumably since 2003 following construction of the school. It is assumed that the impacted supply well water has distributed PFAS to irrigated areas of the school campus. Six athletic fields are currently used at the Site, which have been irrigated with untreated well water. The athletic fields are shown on Figure 4 in Appendix A, for reference.

Surficial soil sampling at the six athletic fields was performed in October 2022 and January 2023, to understand the impact of irrigation water containing PFAS and evaluate the potential risk to human health for exposure to surficial soil in the fields by student athletes and others. PFAS6 are present in surficial soils (0-6") at concentrations exceeding the Method 1 S-1/GW-1 standards (Section 3), in the range of 1 to 12 ppb.

Surficial geology at the Site is mapped as glacial coarse deposits in the topographically high areas, and as swamp deposits in topographically low areas, with thin till and some bedrock outcrops mapped to the northwest.

A Method 2 Direct Contact Evaluation completed by Sovereign Consulting indicates that the PFAS concentrations in surficial soils in the athletic fields do not present a risk of harm to student athletes, as well as children and adults that may be present at or using the fields.

MassDEP identified PFAS in private drinking water wells north and east of the Site along Kemp and Groton Streets, with three locations identified with PFAS6 concentrations greater than the MMCL of 20 ng/L. To date, one POET system has been installed at 274 Kemp Street. As part of this IRA Plan, Tighe & Bond will install POETs at the other two locations and any new locations with PFAS greater than the MMCL.

Tighe & Bond and the District is initiating a substantial sampling effort to identify private wells impacted by this release, provide bottled water to those locations with a PFAS6 detection, install POET systems at locations where PFAS6 is above the MMCL, and will continue to evaluate CEPs related to PFAS.

5.1 Remediation Waste

No remediation waste has been generated to date under RTN 2-21961.

5.2 Permits

No permits are required for the IRA activities completed to date or the proposed IRA activities planned under RTN 2-21961, with the exception of plumbing permits for the installation of the proposed POET systems in the Town of Dunstable. The Town is requiring that a licensed plumber make the final connections to the potable well system.

5.3 Public Notifications

In accordance with the MCP at 310 CMR 40.1403(3)(h), a copy of the Release Notification Form (RNF) is being provided to the Chief Municipal Officers and Boards of Health in the Towns of Dunstable and Groton. A copy of the letter accompanying the RNF is included in Appendix E, for reference.

In accordance with the MCP at 310 CMR 40.1403(10) a Notice of Environmental Sampling is required any time environmental samples are taken at a property in the course of investigating a release for which a notification to MassDEP has been made on behalf of someone other than the owner of the property within 30 days of the date the sample results are issued by the laboratory. Copies of these notification letters will be provided in future IRA Status Reports.

Section 6

Limitations

1. This report has been prepared on behalf of and for the exclusive use of the Client and is subject to and issued in accordance with the Agreement and the provisions thereof. Documents provided on this project shall not, in whole or in part, be disseminated or conveyed to any other party, nor used by any other party without the prior written consent of Tighe & Bond. Reuse of documents by Client or others without Tighe & Bond's written permission and mutual agreement shall be at the user's sole risk, without liability on Tighe & Bond's part and Client agrees to indemnify and hold Tighe & Bond harmless from all claims, damages, and expenses, including attorney's fees, arising out of such unauthorized use or reuse.
2. Tighe & Bond acknowledges and agrees that, subject to the Limitations set forth herein and prior written approval by Tighe & Bond, this report may be provided to specific financial institutions, attorneys, title insurers, lessees and/or governmental agencies identified by Client at or about the time of issuance of the report in connection with the conveyance, mortgaging, leasing, or similar transaction involving the real property which is the subject matter of a report and any work product. Use of this report for any purpose by any persons, firm, entity, or governmental agency shall be deemed acceptance of the restrictions and conditions contained therein, these Limitations and the provisions of Tighe & Bond's Agreement with Client. No warranty, express or implied, is made by way of Tighe & Bond's performance of services or providing an environmental site assessment, including but not limited to any warranty with the contents of a report or with any and all work product.
3. Tighe & Bond performed the subsurface investigation in accordance with our Agreement (including any stated scope and schedule limitations) and used the degree of care and skill ordinarily exercised under similar circumstances by members of the profession practicing in the same or similar locality. The objective of a subsurface investigation is to evaluate the presence or absence of contamination. Where access was denied or conditions obscured, Tighe & Bond provides no opinion or report on such areas. The subsurface investigation may not identify all contaminated media as our scope may be limited to certain locations within a site or due to geologic variability, contamination variability, seasonal conditions, obstructions such as buildings, utilities, or other site features and/or other unknown conditions. Tighe & Bond performed the subsurface investigation using reasonable methods to access and identify the presence of contaminated media. Therefore, additional contaminated media may be present at the site and may be discovered during development and site work, so an appropriate cost contingency should be carried by the Client based on their risk tolerance. Tighe & Bond also makes no opinion or report of contamination that may have migrated off site unless off-site investigations are specifically included in the scope of services.
4. Findings, observations, and conclusions presented in this report, including but not limited to the extent of any subsurface explorations or other tests performed by Tighe & Bond, are limited by the scope of services outlined in the Agreement, which may establish schedule and/or budgetary constraints for an environmental

assessment or phase thereof. Furthermore, while it is anticipated that each assessment will be performed in accordance with generally accepted professional practices and applicable standards (such as ASTM, etc.) and applicable state and Federal regulations, as may be further described in the report and/or the Agreement, Tighe & Bond does not assume responsibility for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of its services.

5. In preparing this report, Tighe & Bond, Inc. may have relied on certain information provided by governmental agencies or personnel as well as information and/or representations provided by other persons, firms, or entities, and on information in the files of governmental agencies made available to Tighe & Bond at the time of the site assessment. To the extent that such information, representations, or files may be inaccurate, missing, incomplete or not provided to Tighe & Bond, Tighe & Bond is not responsible. Although there may be some degree of overlap in the information provided by these various sources, Tighe & Bond does not assume responsibility for independently verifying the accuracy, authenticity, or completeness of any and all information reviewed by or received from others during the course of the site assessment.
6. The assessment presented is based solely upon information obtained or received prior to issuance of the report. If additional environmental or other relevant information is developed at a later date, Client agrees to bring such information to the attention of Tighe & Bond promptly. Upon evaluation of such information, Tighe & Bond reserves the right to recommend modification of this report and its conclusions.
7. Emerging contaminants, including per- and poly-fluorinated alkyl substances (PFAS), are hazardous materials or mixtures (including naturally occurring or manmade chemical, microbial, or radiological substances) that are characterized by having a perceived or real threat to human health, public safety, or the environment for which there are no published health standards or guidelines and there is insufficient or limited available toxicological information or toxicity information that is evolving or being re-evaluated; or there is not significant new source, pathway, or detection limit information. The state of these compounds is constantly being updated and therefore, Tighe & Bond cannot be held liable for not including these compounds in the list of analytes that are analyzed when our services are performed. Unless otherwise specified, Tighe & Bond will only analyze for compounds ordinarily included under similar circumstances by members of the profession practicing in the same or similar locality. Tighe & Bond will not be liable for not including these or any other compounds in the list of target analytes if information regarding their use is not made available by current or former operators/owners at the facility being evaluated. We will also not be liable for not analyzing for the presence of an emerging contaminant, even if that compound is detected at a later date.
8. Tighe & Bond makes no guarantee or warranty that this report (if provided to a regulatory agency) will pass a regulatory audit/review. The Licensed Site Professional (LSP), Licensed Environmental Professional (LEP), Professional Geologist (PG), Professional Engineer (PE) or other relevant professional licensure and the applicable regulatory reviewing agency may have differences of opinion on

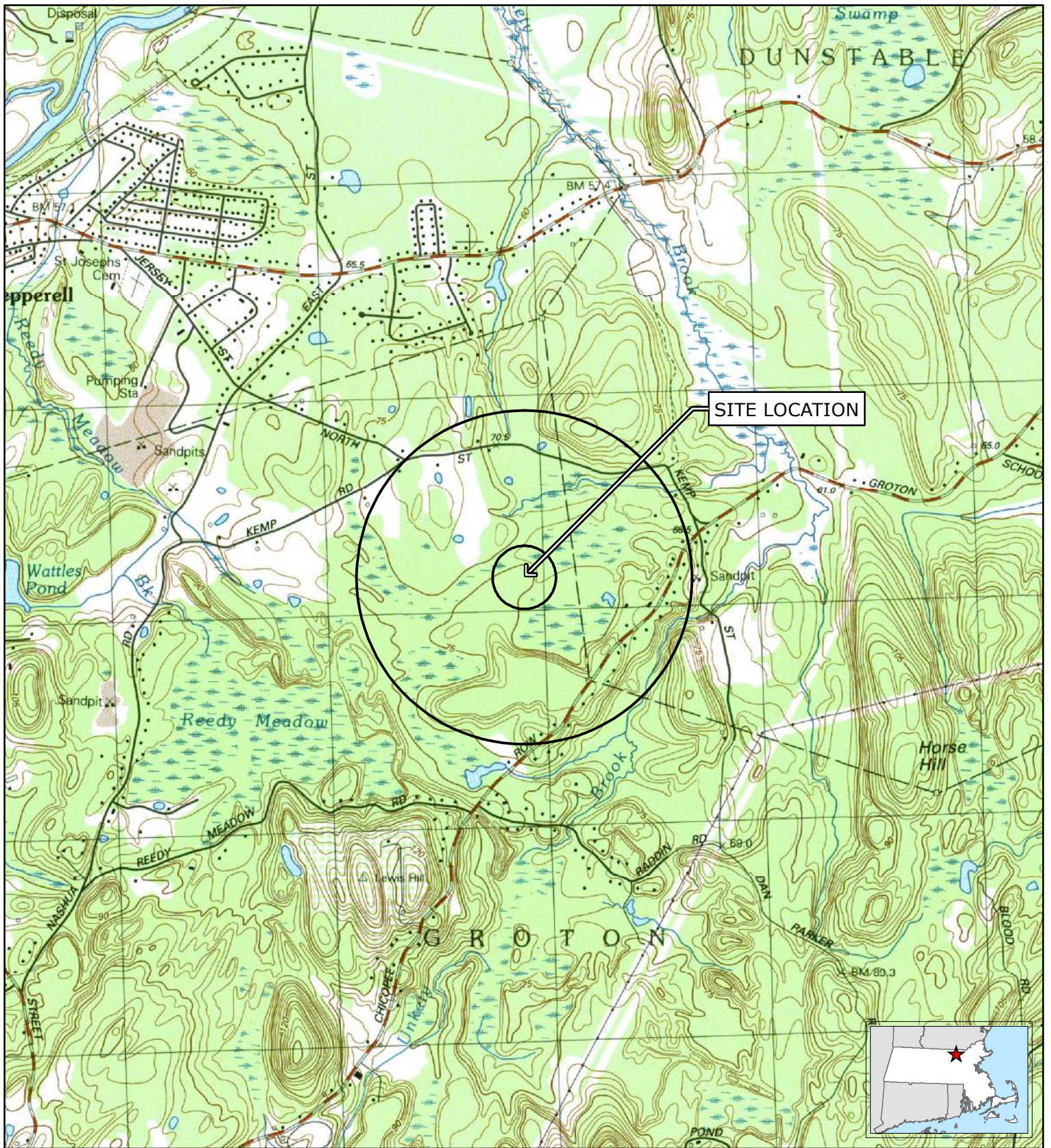
aspects of (and approaches to) the assessment, remediation, risk evaluation or closure and the regulatory agency may request additional information, sampling data, analysis and/or remediation. Such differences of opinion will not be interpreted to imply that Tighe & Bond's services were not performed competently and in accordance with the standard of care. If additional investigations, response action evaluations, or discussions are needed following a regulatory audit/review, Tighe & Bond can provide these services under a separate Agreement.

9. If an Opinion of Probable Construction Costs (OPCC) is provided, Tighe & Bond has no control over the cost or availability of labor, equipment or materials, or over market conditions or the contractor's method of pricing, and that the opinion of probable costs is made on the basis of Tighe & Bond's professional judgment and experience is based on currently available information. Tighe & Bond makes no guarantee nor warranty, expressed or implied, that the actual costs of the construction work will not vary from the OPCC.

\\Tighebond.com\data\Data\Projects\G\G5078 Groton-Dunstable Regional School District\Reports\IRA Plan - April 2023\IRA Plan_REV2.docx

Tighe&Bond

APPENDIX A



SITE LOCATION

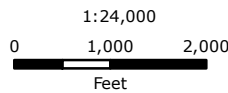
**FIGURE 1
SITE LOCATION**

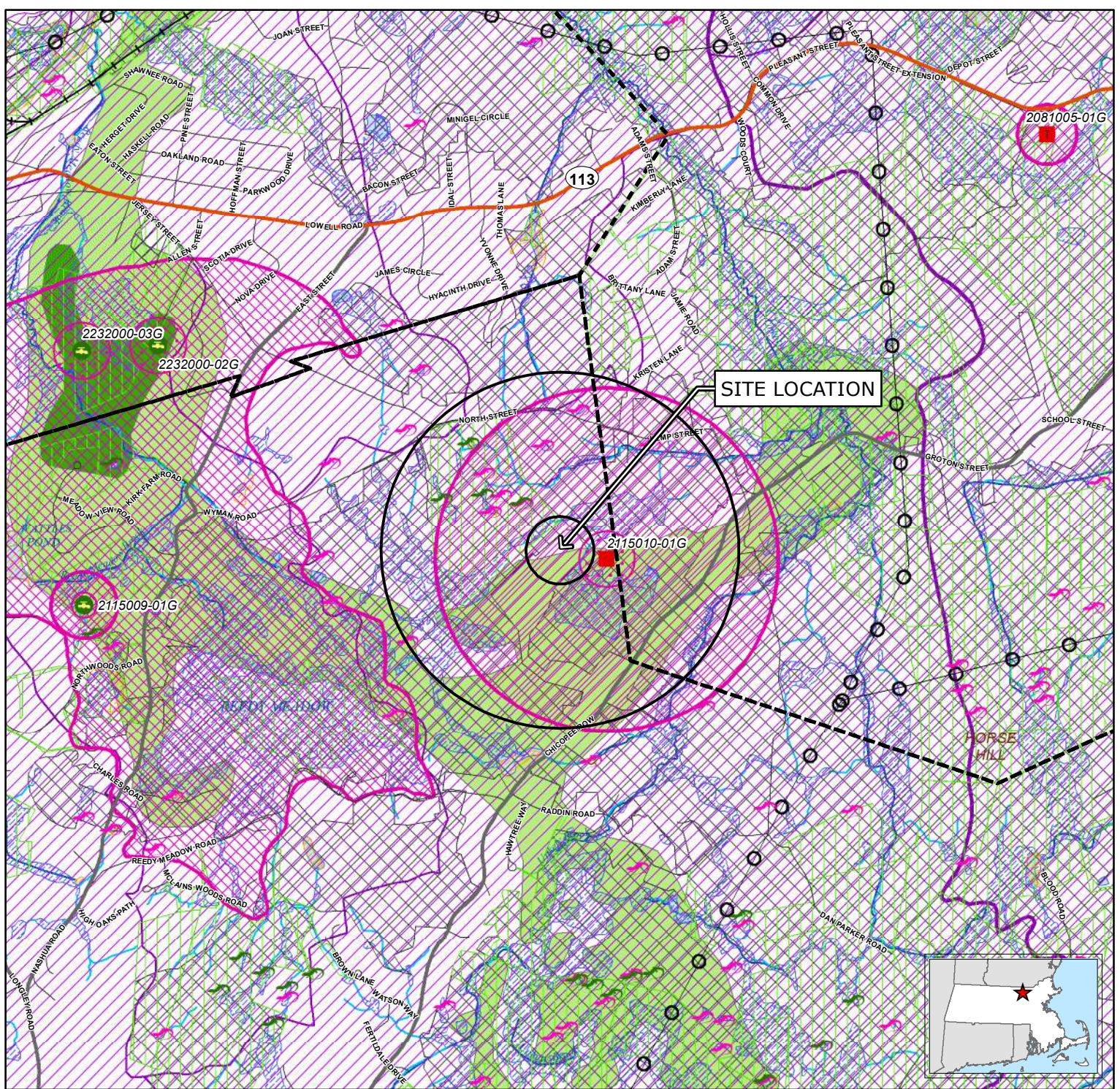
Groton-Dunstable Regional
High School PFAS Sampling
703 Chicopee Row
Groton, Massachusetts

January 2023



Based on USGS Topographic Map for
Pepperell, MA Revised 1988.
Contour Interval Equals 3-meters.
Circles indicate 500-foot and half-mile radii





Legend

- | | | |
|---|--|---|
| NHESP Certified Vernal Pools | Aqueducts | MassDEP Open Water |
| NHESP Potential Vernal Pools | Hydrologic Connections | MassDEP Inland Wetlands |
| Non-Landfill Solid Waste Sites | Stream/Intermittent Stream | MassDEP Coastal Wetlands |
| Proposed Well | Powerline | MassDEP Not Interpreted Wetlands |
| Emergency Surface Water | Pipeline | Public Surface Water Supply (PSWS) |
| Community Public Water Supply - Surface Water | Track or Trail | Water Bodies |
| Community Public Water Supply - Groundwater | Trains | Non-Potential Drinking Water Source Area - High Yield |
| Non-Community Non-Transient Public Water Supply | Public Surface Water Supply Protection Area (Zone A) | Non-Potential Drinking Water Source Area - Medium Yield |
| Non-Community Transient Public Water Supply | DEP Approved Wellhead Protection Area (Zone I) | Potentially Productive Medium Yield Aquifer |
| Limited Access Highway | DEP Approved Wellhead Protection Area (Zone II) | Potentially Productive High Yield Aquifer |
| Multi-Lane Highway, NOT Limited Access | DEP Interim Wellhead Protection Area (IWPA) | County Boundary |
| Other Numbered Route | Protected and Recreational Open Space | Municipal Boundary |
| Major Road - Arterials and Collectors | Solid Waste Landfill | USGS Quadrangle Sheet Boundary |
| Minor Street or Road | Area of Critical Environmental Concern (ACEC) | |
| | NHESP Priority Habitats for Rare Species | |
| | NHESP Estimated Habitats for Rare Wildlife | |
| | EPA Designated Sole Source Aquifer | |
| | Major Drainage Basin | |
| | Sub Drainage Basin | |

FIGURE 2 PRIORITY RESOURCES

Groton-Dunstable Regional
High School PFAS Sampling
703 Chicopee Row
Groton, Massachusetts

Data source: Bureau of Geographic Information (MassGIS),
Commonwealth of Massachusetts, Executive Office of Technology
Circles indicate 500-foot and half-mile radii.
Data valid as of January 2023.

1:24,000
0 1,000 2,000
Feet



January 2023

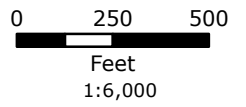
Tighe & Bond

FIGURE 3
PFAS6 RADIUS MAP

LEGEND

- Total Regulated PFAS Concentration In Parts-Per-Trillion (ppt)**
- Non-Detect (ND)
 - Less than 20
 - Greater than 20 But Less Than 90
 - Greater than 90
 - 500' Radius
 - Approximate Parcel Boundary
 - Town Boundary

LOCUS MAP

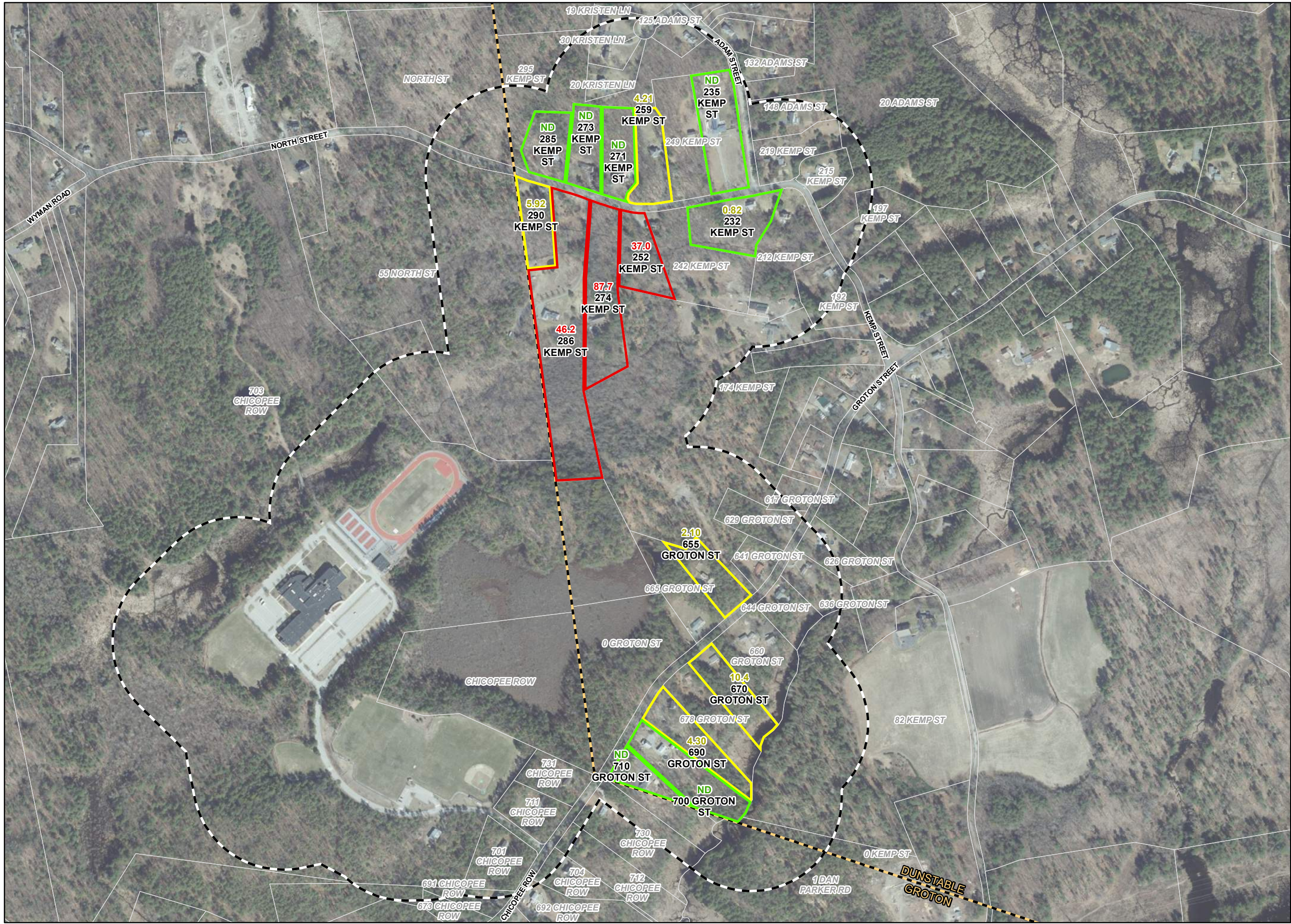


NOTES

1. Based on MassGIS Color Orthophotography (2021)
2. Parcels (FY21) downloaded from MassGIS and are approximate.

**Area Surrounding Groton-Dunstable Regional High School
Dunstable, Massachusetts**

March 2023



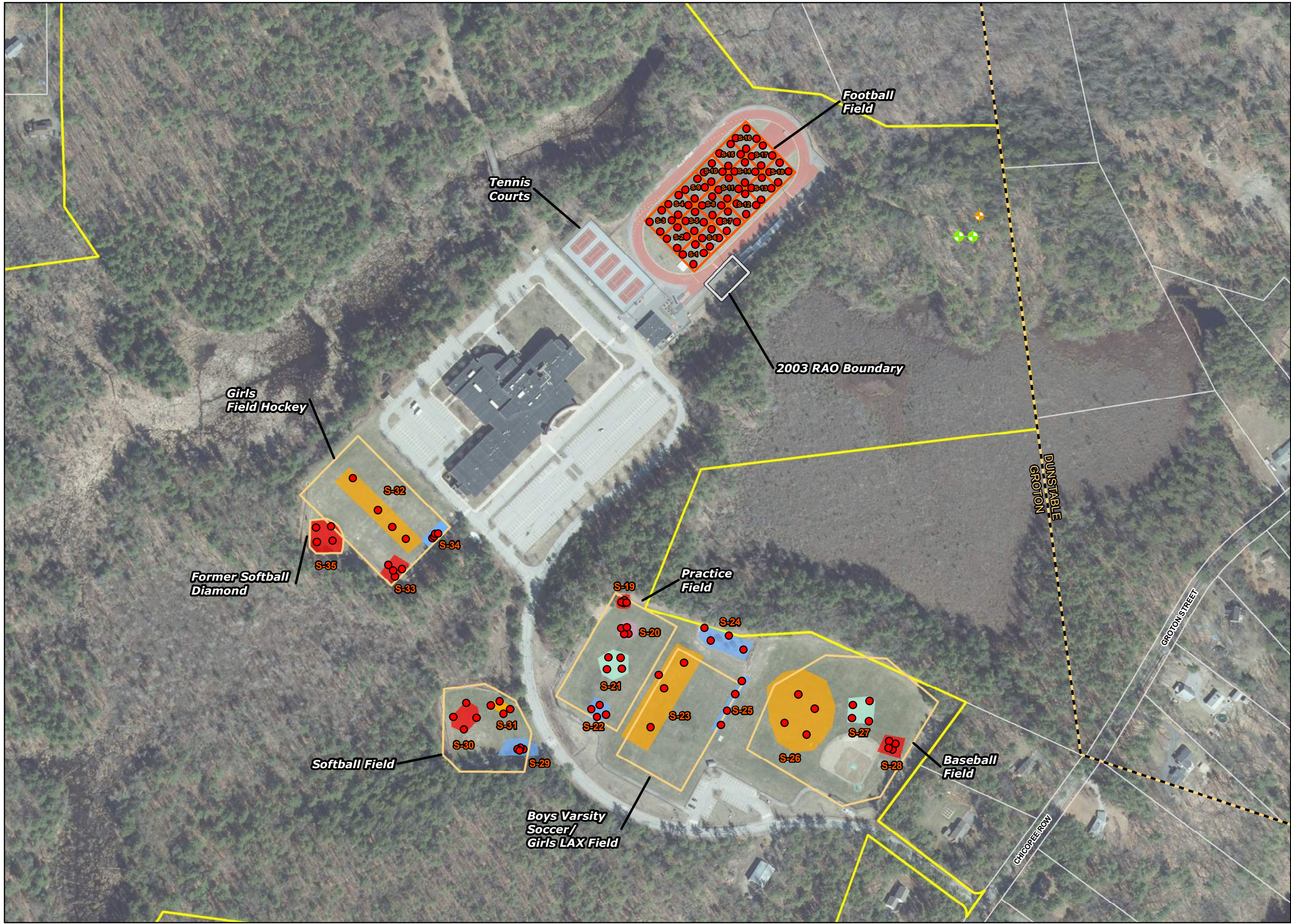
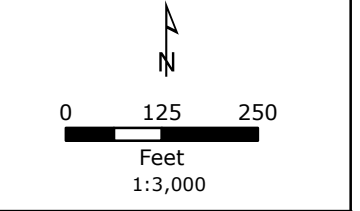
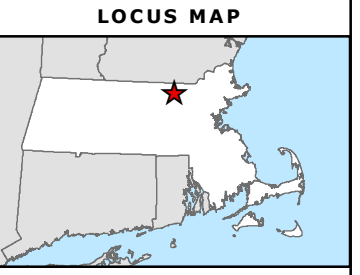


FIGURE 4
SURFICIAL SOIL SAMPLE LOCATIONS

LEGEND

- Sample Location
- ⊕ Supply Well
- ⊕ Existing Monitoring Well Couplet
- Football Field Sampling Grid
- Site Parcel
- Parcel Boundary
- Town Boundary
- Composite Surficial Soil Sample Areas (0 - 0.5')**
- Athletic Field
- Approximate Location of Fire
- Broken Sprinkler Area
- General Coverage Area
- High-Lying Area
- Low-Lying Area
- Stormwater Infrastructure Feature



- NOTES**
1. Based on MassGIS Color Orthophotography (2021)
 2. Data drawn in from approximately georeferenced plan "PROPOSAL_GIS_aerial_GrotonDunstableHS"
 3. Parcels (FY2021) downloaded from MassGIS and are approximate.

Groton-Dunstable Regional High School PFAS Sampling
703 Chicopee Row
Groton, Massachusetts

March 2023



Tighe&Bond

APPENDIX B

TABLE 1
 Surficial Soil Analytical Results (0-6")
 Groton-Dunstable Regional High School
 Football Field PFAS Soil Assessment

Sample Name	MassDEP MCP Soil Criteria		EPCs	S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S-12	S-13	S-14	S-15	S-16
	Method 1	Method 2, S-1/ S-1/GW-1		0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in
PFAS Isotope Dilution (ug/kg)																			
Unregulated PFAS																			
4:2 FTS	NS	NS	-	<1.14	<1.42	<1.61	<1.11	<1.1	<1.19	<1.35	<1.47	<1.45	<1.47	<1.11	<1.39	<1.09	<1.41	<1.47	<1.09
6:2 FTS	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
8:2 FTS	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
N-EtFOSAA	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
N-MeFOSAA	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
PFBS	NS	NS	-	<0.285	<0.355	<0.403	<0.277	<0.275	<0.298	<0.338	<0.367	<0.362	<0.369	<0.278	<0.348	<0.272	<0.353	<0.367	<0.272
PFBA	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
PFDS	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
PFDoA	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
PFHpS	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
PFHxA	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
PFNS	NS	NS	-	<1.14	<1.42	<1.61	<1.11	<1.1	<1.19	<1.35	<1.47	<1.45	<1.47	<1.11	<1.39	<1.09	<1.41	<1.47	<1.09
PFOSA	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
PFPeS	NS	NS	-	<1.14	<1.42	<1.61	<1.11	<1.1	<1.19	<1.35	<1.47	<1.45	<1.47	<1.11	<1.39	<1.09	<1.41	<1.47	<1.09
PFPeA	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
PFTA	NS	NS	-	<0.57	<0.71	<2.51	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
PFTrDA	NS	NS	-	<0.57	<0.71	<2.51	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
PFUnA	NS	NS	-	<0.57	<0.71	<0.806	<0.554	<0.551	<0.597	<0.675	<0.735	<0.725	<0.737	<0.556	<0.697	<0.544	<0.706	<0.735	<0.545
Regulated PFAS																			
PFHpA	0.5	300	0.159	<0.285	<0.355	<0.403	<0.277	<0.275	<0.298	<0.338	<0.367	<0.362	<0.369	<0.278	<0.348	<0.272	<0.353	<0.367	<0.272
PFHxS	0.3	300	0.237	<0.285	<0.355	0.471	<0.277	0.539	0.357	0.375	<0.367	<0.362	<0.369	<0.278	<0.348	<0.272	<0.353	<0.367	<0.272
PFOA	0.72	300	0.203	<0.285	<0.355	<0.403	<0.277	0.716	<0.298	<0.338	0.43	<0.362	<0.369	0.297	<0.348	0.285	0.431	<0.367	<0.272
PFNA	0.32	300	0.171	<0.285	<0.355	<0.403	<0.277	0.374	<0.298	<0.338	<0.367	<0.362	<0.369	<0.278	<0.348	<0.272	0.368	<0.367	<0.272
PFOS	2	300	5.42	6.67	4.24	6.2	5.76	5.43	7.1	5.44	5.57	4.06	4.07	6.24	5.8	11	4.12	5.14	4.08
PFDA	0.3	300	0.221	<0.285	<0.355	<0.403	<0.277	0.531	<0.298	<0.338	0.555	<0.362	<0.369	0.624	<0.348	0.38	0.682	<0.367	<0.272

MassDEP MCP - Massachusetts Department of Environmental Protection Massachusetts Contingency Plan. Effective 04/25/2014 and updates

PFAS data reported in ug/kg; equivalent to parts per billion (ppb)

Other data reported in milligrams per kilogram (mg/kg); equivalent to parts per million (ppm)

NS - No Standard has been developed

BRL - Below Reporting Limit - see laboratory report for details

ND - Not Detected - see laboratory report for details

< xx indicates compound was not reported above laboratory limit.

RCS-1 - Massachusetts Contingency Plan (MCP) Reportable Concentrations (RCS-1) reported in ug/kg

Method 1 - MCP Method 1 Standards for "comprehensive" risk characterization

Method 2 - MCP Method 2 Direct Contact Concentrations for "limited" risk characterization

Soil Action Levels - Developed by Sovereign, Inc.

EPC - Exposure Point Concentrations; average concentration, including non-detect results (RL is multiplied by 0.5)

Boxed values exceed MCP Method 1 S-1/GW-1 standards

TABLE 1
 Surficial Soil Analytical Results (0-6")
 Groton-Dunstable Regional High School
 Football Field PFAS Soil Assessment

Sample Name	MassDEP MCP Soil Criteria		EPCs	S-17	S-18	S-19	S-20	S-21	S-22	S-23	S-24	S-25	S-26	S-27	S-28	S-29	S-30	S-31	S-32	
	Method 1	Method 2, S-1/ Soil Action Levels		0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in	0 - 6 in
Sample Depth	Method 1	Method 2, S-1/ Soil Action Levels		10/4/2022	10/4/2022	1/30/2023	1/30/2023	1/30/2023	1/30/2023	1/30/2023	1/30/2023	1/30/2023	1/30/2023	1/30/2023	1/30/2023	1/30/2023	1/30/2023	1/30/2023	1/30/2023	1/30/2023
Lab Sample ID	S-1/GW-1			L2254870-08	L2254870-09	L2305132-01	L2305132-02	L2305132-03	L2305132-04	L2305132-05	L2305132-06	L2305132-07	L2305132-08	L2305132-09	L2305132-10	L2305132-11	L2305132-12	L2305132-13	L2305132-14	
PFAS Isotope Dilution (ug/kg)																				
Unregulated PFAS																				
4:2 FTS	NS	NS	-	<1.18	<1.1	<1.38	<1.1	<1.16	<1.27	<1.19	<1.08	<1.31	<1.15	<1.22	<1.43	<1.51	<1.11	<1.2	<1.31	
6:2 FTS	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
8:2 FTS	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
N-EtFOSAA	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
N-MeFOSAA	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
PFBS	NS	NS	-	<0.296	<0.274	<0.345	<0.274	<0.29	<0.318	<0.297	<0.27	<0.328	<0.287	<0.304	<0.358	<0.377	<0.277	<0.3	<0.327	
PFBA	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
PFDS	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
PFDoA	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
PFHpS	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
PFHxA	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
PFNS	NS	NS	-	<1.18	<1.1	<1.38	<1.1	<1.16	<1.27	<1.19	<1.08	<1.31	<1.15	<1.22	<1.43	<1.51	<1.11	<1.2	<1.31	
PFOSA	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
PFPeS	NS	NS	-	<1.18	<1.1	<1.38	<1.1	<1.16	<1.27	<1.19	<1.08	<1.31	<1.15	<1.22	<1.43	<1.51	<1.11	<1.2	<1.31	
PFPeA	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
PFTA	NS	NS	-	<0.593	<0.548	<0.69	<1.71	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
PFTrDA	NS	NS	-	<0.593	<0.548	<0.69	<1.71	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
PFUnA	NS	NS	-	<0.593	<0.548	<0.69	<0.549	<0.58	<0.636	<0.594	<0.541	<0.656	<0.574	<0.608	<0.716	<0.754	<0.555	<0.601	<0.654	
Regulated PFAS																				
PFHpA	0.5	300	0.159	<0.296	<0.274	<0.345	<0.274	<0.29	<0.318	<0.297	<0.27	<0.328	<0.287	<0.304	<0.358	<0.377	<0.277	<0.3	<0.327	
PFHxS	0.3	300	0.237	<0.296	0.32	0.387	<0.274	<0.29	<0.318	0.474	<0.27	<0.328	<0.287	<0.304	<0.358	0.514	<0.277	<0.3	0.334	
PFOA	0.72	300	0.203	<0.296	0.294	<0.345	<0.274	<0.29	<0.318	<0.297	<0.27	<0.328	<0.287	<0.304	<0.358	<0.377	<0.277	<0.3	<0.327	
PFNA	0.32	300	0.171	<0.296	<0.274	<0.345	<0.274	<0.29	<0.318	<0.297	<0.27	<0.328	<0.287	<0.304	<0.358	<0.377	<0.277	<0.3	<0.327	
PFOS	2	300	5.42	7.05	5.33	2.62	3.51	6.56	3.61	3.96	1.04	6.44	3.57	3.78	4.45	12.3	10.8	7.82	3.79	
PFDA	0.3	300	0.221	0.318	<0.274	<0.345	<0.274	<0.29	<0.318	<0.297	<0.27	<0.328	<0.287	<0.304	<0.358	<0.377	<0.277	<0.3	<0.327	

MassDEP MCP - Massachusetts Department of Environmental Protection Massachusetts Contingency Plan. Effective 04/25/2014 and updates

PFAS data reported in ug/kg; equivalent to parts per billion (ppb)

Other data reported in milligrams per kilogram (mg/kg); equivalent to parts per million (ppm)

NS - No Standard has been developed

BRL - Below Reporting Limit - see laboratory report for details

ND - Not Detected - see laboratory report for details

< xx indicates compound was not reported above laboratory limit.

RCS-1 - Massachusetts Contingency Plan (MCP) Reportable Concentrations (RCS-1) reported in ug/kg

Method 1 - MCP Method 1 Standards for "comprehensive" risk characterization

Method 2 - MCP Method 2 Direct Contact Concentrations for "limited" risk characterization

Soil Action Levels - Developed by Sovereign, Inc.

EPC - Exposure Point Concentrations; average concentration, including non-detect results (RL is multiplied by 0.5)

Boxed values exceed MCP Method 1 S-1/GW-1 standards

TABLE 1
 Surficial Soil Analytical Results (0-6")
 Groton-Dunstable Regional High School
 Football Field PFAS Soil Assessment

Sample Name	MassDEP MCP Soil Criteria		EPCs	S-33	S-34	S-35	EQUIPMENT BLANK	EQUIPMENT BLANK	FIELD BLANK	FIELD BLANK
	Method 1	Method 2, S-1/ Soil Action Levels		0 - 6 in 1/30/2023 L2305132-15	0 - 6 in 1/31/2023 L2305214-01	0 - 6 in 1/31/2023 L2305214-02	0 - 6 in 10/4/2022 L2254870-10	0 - 6 in 1/30/2023 L2305132-17	0 - 6 in 10/4/2022 L2254870-02	0 - 6 in 1/30/2023 L2305132-16
PFAS Isotope Dilution (ug/kg)										
Unregulated PFAS										
4:2 FTS	NS	NS	-	<1.54	<1.18	<1.11	ng/L	ng/L	ng/L	ng/L
6:2 FTS	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
8:2 FTS	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
N-EtFOSAA	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
N-MeFOSAA	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
PFBS	NS	NS	-	<0.386	<0.295	<0.278	<1.96	<1.84	<1.76	<1.94
PFBA	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
PFDS	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
PFDoA	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
PFHpS	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
PFHxA	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
PFNS	NS	NS	-	<1.54	<1.18	<1.11	<1.96	<1.84	<1.76	<1.94
PFOSA	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
PFPeS	NS	NS	-	<1.54	<1.18	<1.11	<1.96	<1.84	<1.76	<1.94
PFPeA	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
PFTA	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
PFTrDA	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
PFUnA	NS	NS	-	<0.773	<0.59	<0.557	<1.96	<1.84	<1.76	<1.94
Regulated PFAS										
PFHpA	0.5	300	0.159	<0.386	<0.295	<0.278	<1.96	<1.84	<1.76	<1.94
PFHxS	0.3	300	0.237	<0.386	0.572	<0.278	<1.96	<1.84	<1.76	<1.94
PFOA	0.72	300	0.203	<0.386	<0.295	<0.278	<1.96	<1.84	<1.76	<1.94
PFNA	0.32	300	0.171	<0.386	<0.295	<0.278	<1.96	<1.84	<1.76	<1.94
PFOS	2	300	5.42	2.89	6.92	2.19	<1.96	<1.84	<1.76	<1.94
PFDA	0.3	300	0.221	<0.386	<0.295	<0.278	<1.96	<1.84	<1.76	<1.94

MassDEP MCP - Massachusetts Department of Environmental Protection Massachusetts Contingency Plan. Effective 04/25/2014 and updates

PFAS data reported in ug/kg; equivalent to parts per billion (ppb)

Other data reported in milligrams per kilogram (mg/kg); equivalent to parts per million (ppm)

NS - No Standard has been developed

BRL - Below Reporting Limit - see laboratory report for details

ND - Not Detected - see laboratory report for details

< xx indicates compound was not reported above laboratory limit.

RCS-1 - Massachusetts Contingency Plan (MCP) Reportable Concentrations (RCS-1) reported in ug/kg

Method 1 - MCP Method 1 Standards for "comprehensive" risk characterization

Method 2 - MCP Method 2 Direct Contact Concentrations for "limited" risk characterization

Soil Action Levels - Developed by Sovereign, Inc.

EPC - Exposure Point Concentrations; average concentration, including non-detect results (RL is multiplied by 0.5)

Boxed values exceed MCP Method 1 S-1/GW-1 standards

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan	232 Kemp Street
Sampling Date	GW-1 Standard & MMCL	6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		0.9 J
Perfluorohexanoic acid (PFHxA)		1.1 J
Perfluorohexanesulfonic acid (PFHxS)		ND (1.7)
Perfluoroheptanoic acid (PFHpA)		ND (1.7)
Perfluorooctanoic acid (PFOA)		0.8
Perfluorooctanesulfonic acid (PFOS)		ND (1.7)
Perfluorononanoic acid (PFNA)		ND (1.7)
Perfluorodecanoic acid (PFDA)		ND (1.7)
N-EtFOSAA		ND (1.7)
Perfluoroundecanoic acid (PFUnA)		ND (1.7)
N-MeFOSAA		ND (3.5)
Perfluorododecanoic acid (PFDoA)		ND (1.7)
Perfluorotridecanoic acid (PFTrDA)		ND (1.7)
Perfluorotetradecanoic acid (PFTA)		ND (1.7)
Total (All Compounds)		0.9
Regulated Total	20	0.8

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

J = Estimated Value (1/2 of value used in total)

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan GW-1 Standard & MMCL	235 Kemp Street
Sampling Date		6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		ND (1.7)
Perfluorohexanoic acid (PFHxA)		ND (1.7)
Perfluorohexanesulfonic acid (PFHxS)		ND (1.7)
Perfluoroheptanoic acid (PFHpA)		ND (1.7)
Perfluorooctanoic acid (PFOA)		ND (1.7)
Perfluorooctanesulfonic acid (PFOS)		ND (1.7)
Perfluorononanoic acid (PFNA)		ND (1.7)
Perfluorodecanoic acid (PFDA)		ND (1.7)
N-EtFOSAA		ND (1.7)
Perfluoroundecanoic acid (PFUnA)		ND (1.7)
N-MeFOSAA		ND (3.5)
Perfluorododecanoic acid (PFDoA)		ND (1.7)
Perfluorotridecanoic acid (PFTrDA)		ND (1.7)
Perfluorotetradecanoic acid (PFTA)		ND (1.7)
Total (All Compounds)		ND (1.7)
Regulated Total	20	ND (1.7)

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan GW-1 Standard & MMCL	252 Kemp Street
Sampling Date		6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		4.1
Perfluorohexanoic acid (PFHxA)		0.7 J
Perfluorohexanesulfonic acid (PFHxS)		22
Perfluoroheptanoic acid (PFHpA)		0.3 J
Perfluorooctanoic acid (PFOA)		0.9 J
Perfluorooctanesulfonic acid (PFOS)		15
Perfluorononanoic acid (PFNA)		ND (1.7)
Perfluorodecanoic acid (PFDA)		ND (1.7)
N-EtFOSAA		ND (1.7)
Perfluoroundecanoic acid (PFUnA)		ND (1.7)
N-MeFOSAA		ND (1.7)
Perfluorododecanoic acid (PFDoA)		ND (1.7)
Perfluorotridecanoic acid (PFTrDA)		ND (1.7)
Perfluorotetradecanoic acid (PFTA)		ND (1.7)
Total (All Compounds)		42
Regulated Total	20	38

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

J = Estimated Value (1/2 of value used in total)

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan	259 Kemp Street
Sampling Date	GW-1 Standard & MMCL	6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		0.5
Perfluorohexanoic acid (PFHxA)		ND (1.7)
Perfluorohexanesulfonic acid (PFHxS)		2.5
Perfluoroheptanoic acid (PFHpA)		ND (1.7)
Perfluorooctanoic acid (PFOA)		ND (1.7)
Perfluorooctanesulfonic acid (PFOS)		1.7
Perfluorononanoic acid (PFNA)		ND (1.7)
Perfluorodecanoic acid (PFDA)		ND (1.7)
N-EtFOSAA		ND (1.7)
Perfluoroundecanoic acid (PFUnA)		ND (1.7)
N-MeFOSAA		ND (3.4)
Perfluorododecanoic acid (PFDoA)		ND (1.7)
Perfluorotridecanoic acid (PFTrDA)		ND (1.7)
Perfluorotetradecanoic acid (PFTA)		ND (1.7)
Total (All Compounds)		4.7
Regulated Total	20	4.2

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan	271 Kemp Street
Sampling Date	GW-1 Standard & MMCL	6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		NA
Perfluorohexanoic acid (PFHxA)		NA
Perfluorohexanesulfonic acid (PFHxS)		ND (1.8)
Perfluoroheptanoic acid (PFHpA)		ND (1.8)
Perfluorooctanoic acid (PFOA)		ND (1.8)
Perfluorooctanesulfonic acid (PFOS)		ND (1.8)
Perfluorononanoic acid (PFNA)		ND (1.8)
Perfluorodecanoic acid (PFDA)		ND (1.8)
N-EtFOSAA		NA
Perfluoroundecanoic acid (PFUnA)		NA
N-MeFOSAA		NA
Perfluorododecanoic acid (PFDoA)		NA
Perfluorotridecanoic acid (PFTrDA)		NA
Perfluorotetradecanoic acid (PFTA)		NA
Total (All Compounds)		NA
Regulated Total	20	ND (1.8)

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

J = Estimated Result (1/2 of value used in total)

NA = Not Analyzed

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan GW-1 Standard & MMCL	273 Kemp Street
Sampling Date		6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		ND (1.8)
Perfluorohexanoic acid (PFHxA)		ND (1.8)
Perfluorohexanesulfonic acid (PFHxS)		ND (1.8)
Perfluoroheptanoic acid (PFHpA)		ND (1.8)
Perfluorooctanoic acid (PFOA)		ND (1.8)
Perfluorooctanesulfonic acid (PFOS)		ND (1.8)
Perfluorononanoic acid (PFNA)		ND (1.8)
Perfluorodecanoic acid (PFDA)		ND (1.8)
N-EtFOSAA		ND (1.8)
Perfluoroundecanoic acid (PFUnA)		ND (1.8)
N-MeFOSAA		ND (3.6)
Perfluorododecanoic acid (PFDoA)		ND (1.8)
Perfluorotridecanoic acid (PFTrDA)		ND (1.8)
Perfluorotetradecanoic acid (PFTA)		ND (1.8)
Total (All Compounds)		ND (1.8)
Regulated Total	20	ND (1.8)

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan GW-1 Standard & MMCL	274 Kemp Street										
		6/30/2022	7/25/2022			8/30/2022			10/17/2022			
			POET INSTALLED	INF	MID	EFF	INF	MID	EFF	INF	MID	EFF
Well Depth (feet): UNKNOWN												
<i>EPA 537.1 (ng/L)</i>												
Perfluorobutanesulfonic acid (PFBS)		9.5		7.5	ND (1.8)	ND (1.7)	NA	NA	NA	6.8	ND (1.7)	ND (1.8)
Perfluorohexanoic acid (PFHxA)		4.7		3.6	ND (1.8)	ND (1.7)	NA	NA	NA	4.3	ND (1.7)	ND (1.8)
Perfluorohexanesulfonic acid (PFHxS)		63		46	ND (1.8)	ND (1.7)	46	ND (1.7)	ND (1.8)	44	ND (1.7)	ND (1.8)
Perfluoroheptanoic acid (PFHpA)		2.4		1.3 J	ND (1.8)	ND (1.7)	1.5 J	ND (1.7)	ND (1.8)	1.8	ND (1.7)	ND (1.8)
Perfluorooctanoic acid (PFOA)		5.2		3.6	ND (1.8)	ND (1.7)	3.6	ND (1.7)	ND (1.8)	3.9	ND (1.7)	ND (1.8)
Perfluorooctanesulfonic acid (PFOS)		52		36	ND (1.8)	ND (1.7)	37	ND (1.7)	ND (1.8)	38	ND (1.7)	ND (1.8)
Perfluorononanoic acid (PFNA)		ND (1.7)		ND (1.7)	ND (1.8)	ND (1.7)	ND (1.7)	ND (1.7)	ND (1.8)	ND (1.7)	ND (1.7)	ND (1.8)
Perfluorodecanoic acid (PFDA)		ND (1.7)		ND (1.7)	ND (1.8)	ND (1.7)	ND (1.7)	ND (1.7)	ND (1.8)	ND (1.7)	ND (1.7)	ND (1.8)
N-EtFOSAA		ND (1.7)		ND (1.7)	ND (1.8)	ND (1.7)	NA	NA	NA	ND (1.7)	ND (1.7)	ND (1.8)
Perfluoroundecanoic acid (PFUnA)		ND (1.7)		ND (1.7)	ND (1.8)	ND (1.7)	NA	NA	NA	ND (1.7)	ND (1.7)	ND (1.8)
N-MeFOSAA		ND (3.4)		ND (1.7)	ND (1.8)	ND (1.7)	NA	NA	NA	ND (1.7)	ND (1.7)	ND (1.8)
Perfluorododecanoic acid (PFDoA)		ND (1.7)		ND (1.7)	ND (1.8)	ND (1.7)	NA	NA	NA	ND (1.7)	ND (1.7)	ND (1.8)
Perfluorotridecanoic acid (PFTDA)		ND (1.7)		ND (1.7)	ND (1.8)	ND (1.7)	NA	NA	NA	ND (1.7)	ND (1.7)	ND (1.8)
Perfluorotetradecanoic acid (PFTA)		ND (1.7)		ND (1.7)	ND (1.8)	ND (1.7)	NA	NA	NA	ND (1.7)	ND (1.7)	ND (1.8)
Total (All Compounds)		137		97	ND (1.8)	ND (1.7)	NA	NA	NA	99	ND (1.7)	ND (1.8)
Regulated Total	20	123		86	ND (1.8)	ND (1.7)	87	ND (1.7)	ND (1.8)	88	ND (1.7)	ND (1.8)

NOTES:
 Gray colored cells indicate those 6 compounds included in the regulated PFAS Total
 ND = Not detected above the lab reporting limits shown in parentheses.
 Bolded values exceed the proposed Method 1 Standard
 MMCL is Massachusetts Maximum Contaminant Level
 J = Estimated Result (1/2 of value used in total)

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan	285 Kemp Street
Sampling Date	GW-1 Standard & MMCL	6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		ND (1.7)
Perfluorohexanoic acid (PFHxA)		ND (1.7)
Perfluorohexanesulfonic acid (PFHxS)		ND (1.7)
Perfluoroheptanoic acid (PFHpA)		ND (1.7)
Perfluorooctanoic acid (PFOA)		ND (1.7)
Perfluorooctanesulfonic acid (PFOS)		ND (1.7)
Perfluorononanoic acid (PFNA)		ND (1.7)
Perfluorodecanoic acid (PFDA)		ND (1.7)
N-EtFOSAA		ND (1.7)
Perfluoroundecanoic acid (PFUnA)		ND (1.7)
N-MeFOSAA		ND (3.4)
Perfluorododecanoic acid (PFDoA)		ND (1.7)
Perfluorotridecanoic acid (PFTrDA)		ND (1.7)
Perfluorotetradecanoic acid (PFTA)		ND (1.7)
Total (All Compounds)		ND (1.7)
Regulated Total	20	ND (1.7)

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan GW-1 Standard & MMCL	286 Kemp Street
Sampling Date		6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		5.0
Perfluorohexanoic acid (PFHxA)		1.1
Perfluorohexanesulfonic acid (PFHxS)		25
Perfluoroheptanoic acid (PFHpA)		ND (1.8)
Perfluorooctanoic acid (PFOA)		1.2
Perfluorooctanesulfonic acid (PFOS)		20
Perfluorononanoic acid (PFNA)		ND (1.8)
Perfluorodecanoic acid (PFDA)		ND (1.8)
N-EtFOSAA		ND (1.8)
Perfluoroundecanoic acid (PFUnA)		ND (1.8)
N-MeFOSAA		ND (1.8)
Perfluorododecanoic acid (PFDoA)		ND (1.8)
Perfluorotridecanoic acid (PFTrDA)		ND (1.8)
Perfluorotetradecanoic acid (PFTA)		ND (1.8)
Total (All Compounds)		52
Regulated Total	20	46

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan	290 Kemp Street
Sampling Date	GW-1 Standard & MMCL	6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		5.1
Perfluorohexanoic acid (PFHxA)		3.3
Perfluorohexanesulfonic acid (PFHxS)		ND (1.8)
Perfluoroheptanoic acid (PFHpA)		ND (1.8)
Perfluorooctanoic acid (PFOA)		3.6
Perfluorooctanesulfonic acid (PFOS)		2
Perfluorononanoic acid (PFNA)		ND (1.8)
Perfluorodecanoic acid (PFDA)		ND (1.8)
N-EtFOSAA		ND (1.8)
Perfluoroundecanoic acid (PFUnA)		ND (1.8)
N-MeFOSAA		ND (3.5)
Perfluorododecanoic acid (PFDoA)		ND (1.8)
Perfluorotridecanoic acid (PFTrDA)		ND (1.8)
Perfluorotetradecanoic acid (PFTA)		ND (1.8)
Total (All Compounds)		14
Regulated Total	20	5.9

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan	655 Groton Street
Sampling Date	GW-1 Standard & MMCL	6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		1.1
Perfluorohexanoic acid (PFHxA)		0.8
Perfluorohexanesulfonic acid (PFHxS)		ND (1.7)
Perfluoroheptanoic acid (PFHpA)		ND (1.7)
Perfluorooctanoic acid (PFOA)		2.1
Perfluorooctanesulfonic acid (PFOS)		ND (1.7)
Perfluorononanoic acid (PFNA)		ND (1.7)
Perfluorodecanoic acid (PFDA)		ND (1.7)
N-EtFOSAA		ND (1.7)
Perfluoroundecanoic acid (PFUnA)		ND (1.7)
N-MeFOSAA		ND (3.4)
Perfluorododecanoic acid (PFDoA)		ND (1.7)
Perfluorotridecanoic acid (PFTrDA)		ND (1.7)
Perfluorotetradecanoic acid (PFTA)		ND (1.7)
Total (All Compounds)		4.0
Regulated Total	20	2.1

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan	670 Groton Street
Sampling Date	GW-1 Standard & MMCL	6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		ND (1.7)
Perfluorohexanoic acid (PFHxA)		3.4
Perfluorohexanesulfonic acid (PFHxS)		0.8
Perfluoroheptanoic acid (PFHpA)		2.6
Perfluorooctanoic acid (PFOA)		4.3
Perfluorooctanesulfonic acid (PFOS)		2.7
Perfluorononanoic acid (PFNA)		ND (1.7)
Perfluorodecanoic acid (PFDA)		ND (1.7)
N-EtFOSAA		ND (1.7)
Perfluoroundecanoic acid (PFUnA)		ND (1.7)
N-MeFOSAA		ND (3.4)
Perfluorododecanoic acid (PFDoA)		ND (1.7)
Perfluorotridecanoic acid (PFTrDA)		ND (1.7)
Perfluorotetradecanoic acid (PFTA)		ND (1.7)
Total (All Compounds)		13.8
Regulated Total	20	10.4

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

TABLE 2
PFAS Drinking Water Summary
Groton-Dunstable, Massachusetts
RTN 2-21961

Parameter	Massachusetts Contingency Plan	690 Groton Street
Sampling Date	GW-1 Standard & MMCL	6/30/2022
Well Depth (feet): UNKNOWN		
EPA 537.1 (ng/L)		
Perfluorobutanesulfonic acid (PFBS)		ND (1.7)
Perfluorohexanoic acid (PFHxA)		ND (1.7)
Perfluorohexanesulfonic acid (PFHxS)		ND (1.7)
Perfluoroheptanoic acid (PFHpA)		ND (1.7)
Perfluorooctanoic acid (PFOA)		ND (1.7)
Perfluorooctanesulfonic acid (PFOS)		4.3
Perfluorononanoic acid (PFNA)		ND (1.7)
Perfluorodecanoic acid (PFDA)		ND (1.7)
N-EtFOSAA		ND (1.7)
Perfluoroundecanoic acid (PFUnA)		ND (1.7)
N-MeFOSAA		ND (3.5)
Perfluorododecanoic acid (PFDoA)		ND (1.7)
Perfluorotridecanoic acid (PFTrDA)		ND (1.7)
Perfluorotetradecanoic acid (PFTA)		ND (1.7)
Total (All Compounds)		4.3
Regulated Total	20	4.3

NOTES:

Gray colored cells indicate those 6 compounds included in the regulated PFAS Total

ND = Not detected above the lab reporting limits shown in parentheses.

Bolded values exceed the proposed Method 1 Standard

MMCL is Massachusetts Maximum Contaminant Level

Tighe&Bond

APPENDIX C

G-5078-003-02
March 28, 2023

Mr. John Robichaud
Director of Buildings and Grounds
Groton-Dunstable Regional School District
344 Main Street
Groton, MA 01450

Re: **Groton-Dunstable Regional High School
Limited Subsurface Assessment – PFAS
Athletic Fields Surficial Soil Results**

Dear Mr. Robichaud:

Tighe & Bond has received the per- and polyfluoroalkyl substances (PFAS) laboratory analytical results for surficial soil samples collected from the athletic fields at the Groton-Dunstable Regional High School on January 30 and 31, 2023. The samples were collected to characterize the potential risk posed to student athletes using the athletic fields, as well as assess the impacts from use of the irrigation system at the campus. The sample results are summarized in the attached Table 1, and the sample locations (S-1 through S-35) are shown on the attached Figure 1.

Tighe & Bond previously collected surficial soil samples in a grid pattern throughout the football field for PFAS analysis (samples S-1 through S-18,) on October 4, 2022. Analytical results indicate several PFAS compounds were detected at concentrations exceeding the Massachusetts Department of Environmental Protection (MassDEP) Method 1 standards. The Method 1 standards conservatively measure risk of harm to human health based on direct contact with the soil, in addition to the leaching potential of a given contaminant from the soil into groundwater, which could result in exposure to the contaminant from consuming the underlying groundwater. The Method 1 standards for each of the six PFAS compounds regulated by MassDEP (PFAS6) are provided in Table 1.

As shown on Figure 1, the January 2023 surficial soil samples (S-19 through S-35) were collected from the five additional athletic fields on the campus (baseball, boys varsity soccer/girls lacrosse, practice, softball, and girls field hockey fields). As shown in Table 1, PFOS and PFHxS are the primary PFAS detected in the samples, which is consistent with a 3M firefighting foam. Other PFAS6 compounds (PFOA, PFNA and/or PFDA) were detected in a limited number of the soil samples, with most samples having one or more PFAS concentrations that exceed one or more of the Method 1 standards (boxed values in Table 1). Unregulated PFAS analytes were not detected in any of the samples.

While the Method 1 soil standards consider risk from direct contact with the soil and risk to underlying groundwater, the Method 2 standards consider risk from direct contact with soil only. As shown in Table 1, sample results for samples S-1 through S-35 are below the Method 2 Direct-Contact Standards for PFAS [300 micrograms per kilogram ($\mu\text{g}/\text{kg}$); equivalent to parts per billion (ppb)]. The MassDEP Method 2 Direct-Contact Standards can be used to determine whether direct contact with contaminated soils (independent of potential groundwater exposure) is likely to pose a significant risk to human health. Comparison of the S-1 through S-35 soil sample results to the MassDEP Method 2 Direct-Contact Standards indicates that direct contact with the fields does not pose a significant risk to human health.



To confirm the Method 2 Direct-Contact Standards are sufficiently protective, Tighe & Bond contracted with a third-party risk assessor (Sovereign Consulting, Inc. of Foxborough, Massachusetts – “Sovereign”) to further evaluate the Method 2 Direct-Contact Standards, incorporating exposure from soil dust inhalation, such as that which could result from athletic use of the fields (the Method 2 Direct-Contact Standards do not specifically include potential impacts to human health through an inhalation pathway). Sovereign also increased the intensity of soil exposure to conservatively reflect more intense contact with soil expected during sports, as opposed to passive use of the property (higher potential soil ingestion rates, soil dermal absorption (through skin), and soil particle concentrations in air).

Sovereign first applied a hypothetical PFAS soil concentration of 100 ppb for each of the PFAS6 compounds. Sovereign then calculated non-carcinogenic Hazard Indices (HI) using the hypothetical PFAS6 levels (100 ppb) for each individual PFAS6 compound. The HI was calculated for children (most vulnerable), youth, and adults (least vulnerable) using increased exposure assumptions to represent exposure associated with sports field activities. Sovereign then used the Child HI (most protective) to back-calculate maximum acceptable soil Action Levels (AL) based on a target HI of 0.2. An HI of 0.2 is the same level of protectiveness provided by MassDEP Method 1 standards. The calculations were performed using toxicity standards and risk assessment methodology promulgated by MassDEP. The maximum acceptable AL was 300 ppb for each PFAS6 compound (consistent with the Method 2 Direct Contact Standards), confirming that level represents the maximum concentration each PFAS6 compound can exist in the athletic fields without posing significant risk to sports field users (child, youth and adults). The calculations also confirm that potential inhalation of soil particles is not a significant exposure pathway for PFAS6 with regard to athletics.

The ALs calculated by Sovereign (0.3 mg/kg; equivalent to 300 µg/kg and 300 ppb) are presented in the in-text table included within the attached Sovereign report (p.2). As indicated at the bottom of page 2 in the Sovereign report, the HIs for each of the PFAS6 compounds at a hypothetical concentration of 300 ppb yields a cumulative HI of 1.2, which is “...slightly above, but consistent with, a maximum acceptable HI of 1.0” (Sovereign, p. 2). The ALs calculated by Sovereign, which are consistent with the Method 2 Direct Contact Standards of 300 ppb for each individual PFAS6, are provided in the attached Table 1.

As shown in Table 1, the PFAS6 concentrations detected across the six athletic fields at the Groton-Dunstable Regional High School campus are well below the 300 ppb Soil Action Levels, indicating that the PFAS in soil do not represent a Significant Risk or Hazard to the users of these fields.

If you have questions, concerns or would like to discuss these findings, please feel free to contact Matt Wagner at 413-572-3258 or mgwagner@tighebond.com.

Very truly yours,

TIGHE & BOND, INC.



Matthew G. Wagner, LSP
Senior Environmental Scientist



Jeffrey L. Arps, LSP Vice President
Vice President

Enclosures: Figure 1
Table 1

Sovereign Consulting, Inc. - *Evaluation of Method 2 S-1 Direct Contact Standards*
Laboratory Report IDs: L2305214, L2305132, L2254870, L2254865



March 29, 2023

via email

Mr. Nicholas Guidi
Tighe & Bond, Inc.
53 Southampton Road
Westfield, Massachusetts 01085

**Re: Derivation of Soil Action Levels for PFAS-6 Considering Recreational Activities (rev)
Groton-Dunstable Regional High School, Groton, Massachusetts
RTN 2-0021961**

Dear Mr. Guidi,

Sovereign Consulting Inc. (Sovereign) has calculated the health-protective soil action levels (ALs) for six individual per- and polyfluorinated alkyl substances (PFAS compounds), calculated to be protective of soil exposure to individual PFAS compounds during use of athletic fields at the Groton-Dunstable High School in Groton, Massachusetts. This letter report describes the AL calculations and use.

Background

PFAS compounds were identified in groundwater of the Groton-Dunstable High School as a result of the use of fire-retardant foam in response to a fire in 2003. This impacted groundwater has been used to irrigate the athletic fields since this time. Concerns have been raised about the effect of this irrigation on soil quality of the sports fields, and whether subsequent exposure to soil in sports fields is associated with an unacceptable health risk. Calculated ALs represent a concentration of each PFAS-6 compound in soil that does not pose a significant risk/hazard.

Risk Calculations

Risk calculations describing soil exposure when using sports fields were initially performed using a surrogate soil concentration to define the soil concentration-risk relationship. As a surrogate, a concentration of 0.1 milligrams per kilogram (mg/kg) was applied for each of the six PFAS compounds as exposure point concentrations (EPCs). Health risks were calculated using this surrogate concentration, enhanced exposure factors (subsequently described), and MassDEP risk characterization guidance. The resultant risk calculations were then used to reverse-calculate a maximum acceptable soil concentration (the AL) associated with a desired target risk level. PFAS compounds are assessed as non-carcinogenic compounds, according to the Massachusetts Department of Environmental Protection (MassDEP) MCP 2019 revisions. Therefore, a Hazard Index of 0.2 was applied as the target "risk" level, consistent with the risk level applied to MCP Method 1 standards.

The PFAS-6 compounds that are regulated by MassDEP are:

- Perfluorodecanoic acid (PFDA)
 - Perfluoroheptanoic acid (PFHpA)
 - Perfluorohexane sulfonic acid (PFHxS)
 - Perfluorooctanoic acid (PFOA)
 - Perfluorooctane sulfonic acid (PFOS)
 - Perfluorononanoic acid (PFNA)
-

As mentioned, MassDEP regulates PFAS-6 compounds as non-carcinogens only, although the International Agency for Research on Cancer (IARC) has classified PFOA as a possible human carcinogen. Since no cancer toxicity value has been adopted by MassDEP for any PFAS-6 compound, the potential carcinogenicity of these compounds was not assessed.

The potential non-carcinogenic health hazards associated with exposure to soil containing the six Mass-DEP regulated PFAS compounds while playing in a sports field were assessed for the following exposure pathways:

- Soil ingestion
- Soil dermal contact
- Inhalation of inhaled soil particles

As shown in **Table 1 - Selected PFAS-6 Properties**, all the PFAS-6 compounds have a molecular weight of greater than 300 g/mole and Henry’s Law Constants generally below 1×10^{-3} atm-m³/mole. This indicates that PFAS-6 compounds are not volatile from aqueous solutions (ScienceDirect 2022). Therefore, volatile inhalation pathways were not assessed.

Table 2 - Summary of Exposure Factors summarizes the exposure assumptions applied to calculate the non-carcinogenic health hazards associated with athletic field use at an assumed soil concentration of 0.1 mg/kg for each of the 6 regulated PFAS compounds. In general, residential exposure assumptions were applied but some exposure factors were modified to maximize the exposure and to better represent recreational activities. Soil ingestion rates, soil dermal absorption, and soil particle concentrations in air were all modified to higher exposure levels than in a typical residential exposure that could reasonably represent sports field activities. Children, youth, and adults were assumed exposed for 130 days per year, which is approximately 3 days per week for 10 months of the year, for 7 years (child and youth) or 16 years (adults). Calculation of ALs is conservatively based on child exposure, since children had the highest total HI of the three age groups. Calculations are presented in **Appendix A** and the results are summarized below:

Compound	Action Level (Non-carcinogenic HI of 0.2)
PFDA	0.3
PFHpA	0.3
PFHxS	0.3
PFOA	0.3
PFOS	0.3
PFNA	0.3

Note that all of the ALs are identical. This occurs because the toxicity values are identical for all six PFAS compounds; they are presented separately for ease in application. Note that if all six PFAS compounds are present in soil at their AL, the total HI is 1.2 (sum of $0.2+0.2+0.2+0.2+0.2+0.2$), which is slightly above, but consistent with, a maximum acceptable HI of 1.0. This is an artifact of using a maximum acceptable HI of 0.2 as a target HI.

To get a total HI for a specific soil location, the detected concentrations can be combined with the ALs in the following manner to get a total HI from all detected PFAS-6 compounds at that location:

$$\frac{PFNA\ Conc}{0.3} + \frac{PFHpA\ Conc}{0.3} + \frac{PFHxS\ Conc}{0.3} + \frac{PFOA\ Conc}{0.3} + \frac{PFOS\ Conc}{0.3} + \frac{PFNA\ Conc}{0.3}$$

= Sample HI

Summary and Conclusion

This assessment has derived action levels (ALs) for individual PFAS-6 compounds of 0.3 mg/kg each. This concentration is associated with a non-carcinogenic hazard index of 0.2 for each constituent, consistent with the default Method 1 target HI, based on recreational contact with soil. Recreators were assumed exposed to soil for 8 hours per day, 130 days per year for 7 or 16 years (depending on age) through three exposure pathways (soil ingestion, soil dermal contact, and inhalation of soil particles) using residential or enhanced residential exposure assumptions to conservatively represent recreational activities.

If you have any questions regarding this assessment, please contact me at cfuller@sovcon.com or at (401) 323-9571.

Regards,

SOVEREIGN CONSULTING INC.



Cynthia Fuller, BS MPH
Health Risk Assessor

Attachments

TABLES

TABLE 1
Selected PFAS-6 Properties
Groton-Dunstable Regional High School, Groton, Massachusetts

PFAS Compound	Molecular Weight ^[1]	Henry's Law Constant [1] (Low/Sole)	Henry's Law Constant ^[1] (High)
	g/mole	atm-m ³ /mole	atm-m ³ /mole
PFHpA	364.1	2.22E-10	--
PFHxS	400.1	1.96E-10	--
PFOA	414.1	2.02E-10	2.52E-03
PFNA	464.1	1.64E-10	--
PFOS	500.1	1.85E-11	4.23E-03
PFDA	514.1	3.55E-10	--

[1]. Values from ITRC (2022) PFAS Technical and Regulatory Guidance Document. Most are modeled values.

A constituent is considered volatile if MW <200 g/mole and H >1x10⁻³ atm-m³/mole;

ScienceDirect: Henry's Law, <https://www.sciencedirect.com/topics/chemistry/henrys-law>).

TABLE 2
Summary of Exposure Factors
Groton-Dunstable Regional High School, Groton, Massachusetts

PARAMETER	VALUE	REFERENCE
Soil exposure point concentration (C_{soil})	Constituent-specific	The applied surrogate soil exposure point concentration (EPC) was 0.1 mg/kg for each PFAS-6 compounds to establish relationship between concentration and risk.
Air exposure point concentration (C_{air})	Constituent-specific	Modeled from soil EPCs using screening level fate and transport models.
Soil ingestion rate (IR)	0.0002 kg/day (all ages)	High soil ingestion rate applied; 2x higher than MassDEP-recommended values for children and 4x higher than for youth and adults (MassDEP 2014).
Relative soil absorption factor, oral (RAFo)	1	Assumed value applicable to PFAS-6 compounds.
Exposed skin surface area, soil exposure (SA)	2,431 cm ² /day (child recreator) 4,427 cm ² /day (youth recreator) 5,653 cm ² /day (adult recreator)	Recommended residential values, assumed applicable to recreators with adjustment (MassDEP 2014).
Soil-skin adherence factor (AF)	0.35 mg/cm ² (child recreator) 0.14 mg/cm ² (youth recreator) 0.13 mg/cm ² (adult recreator)	Recommended residential values, assumed applicable to recreators with adjustment (MassDEP 2014).
Dermal adjustment factor (ADJ)	1.5 (all receptors)	Conservative assumed adjustment factor to increase the recommended dermal (SA x AF) factor by 50 percent.
Relative soil absorption factor, dermal (RAF _d)	0.1	Recommended value (MassDEP 2014).
Inhalable particulate matter concentration in ambient air (PM ₁₀)	60 µg/m ³	Recommended values for construction worker, judged representative of recreational activities (MassDEP 2014).
Relative inhalation absorption factor (RAFi)	1	No recommended value available, a value of 1 assumed.
Recreator exposure frequency (EF)	130 events/year	Assumed exposure 3 days per week for 10 months.
Recreator exposure duration (ED)	1 day/event (soil exposure) 8 hours/event (outdoor air exposure)	Soil ED is conventional value (MassDEP 2014). Outdoor inhalation ED value is assumed.
Recreator exposure period (EP)	7 years (child/youth recreators) 16 years (adult recreator)	Recommended values (MassDEP 2014).

- continued -

TABLE 2
Summary of Exposure Factors
Groton-Dunstable Regional High School, Groton, Massachusetts

PARAMETER	VALUE	REFERENCE
Recreator averaging period (AP)	7 years (child/youth recreators) 16 years (adult recreator)	Conventional averaging times (EP for non-carcinogens) (MassDEP 1995).
Body weight (BW)	17 kg (child recreator) 39.9 kg (youth recreator) 58.7 kg (adult recreator)	Recommended residential values (MassDEP 2014).

MassDEP (2014) Method 1 Numerical Standards and supporting documentation (April).

MassDEP (1995) Guidance for Disposal Site Risk Characterization in Support of the Massachusetts Contingency Plan. Interim Final Policy (July).

APPENDIX A

PFAS-6 Action Level Calculations

PFAS Soil Action Level Summary - Recreators
Non-cancer Endpoint at an Hazard Index of 0.2 Based on Child Exposure

Perfluorodecanoic acid (PFDA)

Exposure pathway	Assumed Soil Concentration (Method 2 Direct Contact Standard) mg/kg	Calculated Hazard Index at Assumed Soil Concentration ^[1] (unitless)	Percent of Total HI	Target HI	Soil Action Level ^[2] (For combined pathways) mg/kg
Soil Ingestion	0.1	0.01	18.5%	0.2	0.3
Soil Dermal Contact	0.1	0.1	81.4%	0.2	0.3
Inhalation of Entrained Soil Particles	0.1	0.00004	0.05%	0.2	0.3
Total Hazard Index		0.1	100%		

Note: calculations are done for each exposure pathway, which results in the same target soil concentration

Perfluoroheptanoic acid (PFHpA)

Exposure pathway	Assumed Soil Concentration (Method 2 Direct Contact Standard) mg/kg	Calculated Hazard Index at Assumed Soil Concentration ^[1] (unitless)	Percent of Total HI	Target HI	Soil Action Level ^[2] (For combined pathways) mg/kg
Soil Ingestion	0.1	0.01	18.5%	0.2	0.3
Soil Dermal Contact	0.1	0.05	81.4%	0.2	0.3
Inhalation of Entrained Soil Particles	0.1	0.00004	0.05%	0.2	0.3
Total Hazard Index		0.07	100%		

Perfluoro-1-hexanesulfonic acid (PFHxS)

Exposure pathway	Assumed Soil Concentration (Method 2 Direct Contact Standard) mg/kg	Calculated Hazard Index at Assumed Soil Concentration ^[1] (unitless)	Percent of Total HI	Target HI	Soil Action Level ^[2] (For combined pathways) mg/kg
Soil Ingestion	0.1	0.01	18.5%	0.2	0.3
Soil Dermal Contact	0.1	0.05	81.4%	0.2	0.3
Inhalation of Entrained Soil Particles	0.1	0.00004	0.05%	0.2	0.3
Total Hazard Index		0.07	100%		

Perfluorooctanoic acid (PFOA)

Exposure pathway	Assumed Soil Concentration (Method 2 Direct Contact Standard) mg/kg	Calculated Hazard Index at Assumed Soil Concentration ^[1] (unitless)	Percent of Total HI	Target HI	Soil Action Level ^[2] (For combined pathways) mg/kg
Soil Ingestion	0.1	0.01	18.5%	0.2	0.30
Soil Dermal Contact	0.1	0.05	81.4%	0.2	0.30
Inhalation of Entrained Soil Particles	0.1	0.00004	0.05%	0.2	0.30
Total Hazard Index		0.07	100%		

Perfluoro-1-octanesulfonic acid (PFOS)

Exposure pathway	Assumed Soil Concentration (Method 2 Direct Contact Standard) mg/kg	Calculated Hazard Index at Assumed Soil Concentration ^[1] (unitless)	Percent of Total HI	Target HI	Soil Action Level ^[2] (For combined pathways) mg/kg
Soil Ingestion	0.1	0.01	18.5%	0.2	0.30
Soil Dermal Contact	0.1	0.05	81.4%	0.2	0.30
Inhalation of Entrained Soil Particles	0.1	0.00004	0.05%	0.2	0.30
Total Hazard Index		0.07	100%		

Perfluorononanoic acid (PFNA)

Exposure pathway	Assumed Soil Concentration (Method 2 Direct Contact Standard) mg/kg	Calculated Hazard Index at Assumed Soil Concentration ^[1] (unitless)	Percent of Total HI	Target HI	Soil Action Level ^[2] (For combined pathways) mg/kg
Soil Ingestion	0.1	0.01	18.5%	0.2	0.30
Soil Dermal Contact	0.1	0.05	81.4%	0.2	0.30
Inhalation of Entrained Soil Particles	0.1	0.00004	0.05%	0.2	0.30
Total Hazard Index		0.07	100%		

[1]. From attached calculations.

2. [(assumed soil concentration) x (pathway-specific HI) x (Percent of total HI)]/Total Calculated HI

PFAS-6 Action Level Calculations

Summary - Recreators

Exposure Pathway	Non-Carcinogenic Hazard Index		
	Child	Youth	Adult
Soil Ingestion	0.07	0.07	0.07
Soil Dermal Contact	0.3	0.1	0.08
Inhalation of Entrained Soil Particles	0.0002	0.0002	0.0002
Total	0.3	0.2	0.2
Maximum Acceptable Limit	1		

Calculations were performed on a surrogate concentration of 0.1 mg/kg for each of the six PFAS compounds. PFAS-6 compounds are not assessed as carcinogens by MassDEP.

PFAS-6 Action Level Calculations

Soil Ingestion - Recreators

ADD = $[C_s \times IR \times RA_{Fo} \times ED \times EF \times EP \times CF / AP]$

HQ = $ADD (nc) / RfDs$

HI = $Sum [HQ]$

ADD = Average daily dose (mg/kg-dy) (nc = non-carcinogen)

C_s = Constituent concentration in soil (mg/kg)

IR = Soil ingestion rate (kg/day)

RA_{Fo} = Relative oral absorption factor (unitless)

ED = Exposure duration (day/event)

EF = Exposure frequency (events/yr)

EP = Exposure period (yr)

CF = Unit conversion factor (yr/dy)

BW = Body weight (kg)

AP = Averaging period (yr)

HQ = Non-carcinogenic hazard quotient (unitless)

HI = Total hazard index (unitless)

RfDs = Subchronic oral reference dose (mg/kg-dy)

No carcinogens in this pathway.

Child

Constituent	C _s (mg/kg)	IR (kg/day)	RA _{Fo} (unitless)	ED (day/event)	EF (events/yr)	EP (yr)	CF (yr/dy)	BW (kg)	AP (nc) (yr)	ADD (nc) (mg/kg)	RfDs (mg/kg-dy)	HQ (unitless)
PFDA	0.10	0.0002	1	1	130	7	2.74E-03	17	7	6.09E-08	5.00E-06	0.01
PFHpA	0.10	0.0002	1	1	130	7	2.74E-03	17	7	6.09E-08	5.00E-06	0.01
PFHxS	0.10	0.0002	1	1	130	7	2.74E-03	17	7	6.09E-08	5.00E-06	0.01
PFOA	0.10	0.0002	1	1	130	7	2.74E-03	17	7	6.09E-08	5.00E-06	0.01
PFOS	0.10	0.0002	1	1	130	7	2.74E-03	17	7	6.09E-08	5.00E-06	0.01
PFNA	0.10	0.0002	1	1	130	7	2.74E-03	17	7	6.09E-08	5.00E-06	0.01
Total									HI =			0.07

Youth

Constituent	C _s (mg/kg)	IR (kg/day)	RA _{Fo} (unitless)	ED (day/event)	EF (events/yr)	EP (yr)	CF (yr/dy)	BW (kg)	AP (nc) (yr)	ADD (nc) (mg/kg)	RfDs (mg/kg-dy)	HQ (unitless)
PFDA	0.10	0.0002	1	1	130	7	2.74E-03	39.9	7	6.09E-08	5.00E-06	0.01
PFHpA	0.10	0.0002	1	1	130	7	2.74E-03	39.9	7	6.09E-08	5.00E-06	0.01
PFHxS	0.10	0.0002	1	1	130	7	2.74E-03	39.9	7	6.09E-08	5.00E-06	0.01
PFOA	0.10	0.0002	1	1	130	7	2.74E-03	39.9	7	6.09E-08	5.00E-06	0.01
PFOS	0.10	0.0002	1	1	130	7	2.74E-03	39.9	7	6.09E-08	5.00E-06	0.01
PFNA	0.10	0.0002	1	1	130	7	2.74E-03	39.9	7	6.09E-08	5.00E-06	0.01
Total									HI =			0.07

Adult

Constituent	C _s (mg/kg)	IR (kg/day)	RA _{Fo} (unitless)	ED (day/event)	EF (events/yr)	EP (yr)	CF (yr/dy)	BW (kg)	AP (nc) (yr)	ADD (nc) (mg/kg)	RfDs (mg/kg-dy)	HQ (unitless)
PFDA	0.10	0.0002	1	1	130	16	2.74E-03	58.7	16	6.09E-08	5.00E-06	0.01
PFHpA	0.10	0.0002	1	1	130	16	2.74E-03	58.7	16	6.09E-08	5.00E-06	0.01
PFHxS	0.10	0.0002	1	1	130	16	2.74E-03	58.7	16	6.09E-08	5.00E-06	0.01
PFOA	0.10	0.0002	1	1	130	16	2.74E-03	58.7	16	6.09E-08	5.00E-06	0.01
PFOS	0.10	0.0002	1	1	130	16	2.74E-03	58.7	16	6.09E-08	5.00E-06	0.01
PFNA	0.10	0.0002	1	1	130	16	2.74E-03	58.7	16	6.09E-08	5.00E-06	0.01
Total									HI =			0.07

PFAS-6 Action Level Calculations

Soil Dermal Contact - Recreators

$$ADD = [C_{soil} \times SA \times AF \times RAFd \times ED \times EF \times EP \times CF] / (BW \times AP)$$

- ADD = Average daily dose (mg/kg-dy) (nc = non-carcinogens)
 C_{soil} = Constituent concentration in soil (mg/kg)
 SA = Exposed skin surface area (cm²/day)
 AF = Soil adherence factor (kg/cm²)
 ADJ = Adjustment factor (assumed).
 RAFd = Dermal Relative Absorption Factor (unitless)
 ED = Exposure duration (day/event)
 EF = Exposure frequency (events/yr)
 EP = Exposure period (yr)
 CF = Unit conversion factor (yr/dy)
 BW = Body weight (kg)
 AP = Averaging period (yr)

$$HQ = \frac{ADD(nc)}{RfDs}$$

$$HI = \text{Sum [HQ]}$$

- HQ = Non-carcinogenic Hazard Quotient (unitless)
 HI = Total Hazard Index (unitless)

RfDs = Reference Dose (mg/kg-dy)

No carcinogens in this pathway.

Child

Constituent	C _{soil} (mg/kg)	SA (cm ² /dy)	AF (kg/cm ²)	ADJ (unitless)	RAFd (unitless)	ED (dy/event)	EF (events/yr)	EP (yr)	CF (yr/dy)	BW (kg)	AP (nc) (yr)	ADD (nc) (mg/kg-dy)	RfDs (mg/kg-dy)	HQ (unitless)
PFDA	0.1	2,431	3.50E-07	1.5	0.1	1	130	7	2.74E-03	17	7	2.67E-07	5.00E-06	0.05
PFHpA	0.1	2,431	3.50E-07	1.5	0.1	1	130	7	2.74E-03	17	7	2.67E-07	5.00E-06	0.05
PFHxS	0.1	2,431	3.50E-07	1.5	0.1	1	130	7	2.74E-03	17	7	2.67E-07	5.00E-06	0.05
PFOA	0.1	2,431	3.50E-07	1.5	0.1	1	130	7	2.74E-03	17	7	2.67E-07	5.00E-06	0.05
PFOS	0.1	2,431	3.50E-07	1.5	0.1	1	130	7	2.74E-03	17	7	2.67E-07	5.00E-06	0.05
Total												HI =	0.27	

Youth

Constituent	C _{soil} (mg/kg)	SA (cm ² /dy)	AF (kg/cm ²)	ADJ (unitless)	RAFd (unitless)	ED (dy/event)	EF (events/yr)	EP (yr)	CF (yr/dy)	BW (kg)	AP (nc) (yr)	ADD (nc) (mg/kg-dy)	RfDs (mg/kg-dy)	HQ (unitless)
PFDA	0.1	4,427	1.40E-07	1.5	0.1	1	130	7	2.74E-03	39.9	7	8.30E-08	5.00E-06	0.02
PFHpA	0.1	4,427	1.40E-07	1.5	0.1	1	130	7	2.74E-03	39.9	7	8.30E-08	5.00E-06	0.02
PFHxS	0.1	4,427	1.40E-07	1.5	0.1	1	130	7	2.74E-03	39.9	7	8.30E-08	5.00E-06	0.02
PFOA	0.1	4,427	1.40E-07	1.5	0.1	1	130	7	2.74E-03	39.9	7	8.30E-08	5.00E-06	0.02
PFOS	0.1	4,427	1.40E-07	1.5	0.1	1	130	7	2.74E-03	39.9	7	8.30E-08	5.00E-06	0.02
PFNA	0.1	4,427	1.40E-07	1.5	0.1	1	130	7	2.74E-03	39.9	7	8.30E-08	5.00E-06	0.02
Total												HI =	0.10	

Adults

Constituent	C _{soil} (mg/kg)	SA (cm ² /dy)	AF (kg/cm ²)	ADJ (unitless)	RAFd (unitless)	ED (dy/event)	EF (events/yr)	EP (yr)	CF (yr/dy)	BW (kg)	AP (yr)	ADD (mg/kg-dy)	RfDs (mg/kg-dy)	HQ (unitless)
PFDA	0.1	5,653	1.30E-07	1.5	0.1	1	130	16	2.74E-03	58.7	16	6.69E-08	5.00E-06	0.01
PFHpA	0.1	5,653	1.30E-07	1.5	0.1	1	130	16	2.74E-03	58.7	16	6.69E-08	5.00E-06	0.01
PFHxS	0.1	5,653	1.30E-07	1.5	0.1	1	130	16	2.74E-03	58.7	16	6.69E-08	5.00E-06	0.01
PFOA	0.1	5,653	1.30E-07	1.5	0.1	1	130	16	2.74E-03	58.7	16	6.69E-08	5.00E-06	0.01
PFOS	0.1	5,653	1.30E-07	1.5	0.1	1	130	16	2.74E-03	58.7	16	6.69E-08	5.00E-06	0.01
PFNA	0.1	5,653	1.30E-07	1.5	0.1	1	130	16	2.74E-03	58.7	16	6.69E-08	5.00E-06	0.01
Total												HI =	0.08	

PFAS-6 Action Level Calculations

Inhalation of Entrained Soil Particles - Recreators

$$C_{\text{air}} = C_{\text{soil}} \times PM_{10} \times CF$$

$$ADE = C_{\text{air}} \times ED \times EF \times EP \times CF / AP$$

$$HQ = ADE \text{ (nc)} / RfCs$$

$$HI = \text{Sum [HQ]}$$

C_{air} = Constituent concentration in ambient air (mg/m³)
 C_{soil} = Constituent concentration in soil (mg/kg)
 PM_{10} = Particulate matter concentration in air (<= 10 microns) (ug/m³)
 CF = Unit conversion factor (kg/ug)
 ADE = Average daily exposure (mg/m³) (nc = non-carcinogen)
 EF = Exposure frequency (events/yr)
 ED = Exposure duration (hr/event)
 EP = Exposure period (yr)
 CF = Unit conversion factor (yr/hr)
 AP = Averaging period (yr)

HQ = Non-carcinogenic hazard quotient (unitless)
 HI = Total hazard index (unitless)
 $RfCs$ = Subchronic Reference concentration (mg/m³)

No carcinogens in this pathway.

Child

Constituent	C _{soil} (mg/kg)	PM ₁₀ (ug/m ³)	CF (kg/ug)	C _{air} (mg/m ³)	ED (hr/event)	EF (events/yr)	EP (yr)	CF (yr/hr)	AP (nc) (yr)	ADE (nc) (mg/m ³)	RfCs (mg/m ³)	HQ (unitless)
PFDA	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
PFHpA	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
PFHxS	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
PFOA	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
PFOS	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
PFNA	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
Total										HI =	0.00021	

Youth

Constituent	C _{soil} (mg/kg)	PM ₁₀ (ug/m ³)	CF (kg/ug)	C _{air} (mg/m ³)	ED (hr/event)	EF (events/yr)	EP (yr)	CF (yr/hr)	AP (nc) (yr)	ADE (nc) (mg/m ³)	RfCs (mg/m ³)	HQ (unitless)
PFDA	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
PFHpA	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
PFHxS	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
PFOA	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
PFOS	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
PFNA	0.1	60	1.00E-09	6.00E-09	8	130	7	1.14E-04	7	7.12E-10	2.00E-05	0.00004
Total										HI =	0.00021	

Adults

Constituent	C _{soil} (mg/kg)	PM ₁₀ (ug/m ³)	CF (kg/ug)	C _{air} (mg/m ³)	ED (hr/event)	EF (events/yr)	EP (yr)	CF (yr/hr)	AP (nc) (yr)	ADE (nc) (mg/m ³)	RfCs (mg/m ³)	HQ (unitless)
PFDA	0.1	60	1.00E-09	6.00E-09	8	130	16	1.14E-04	16	7.12E-10	2.00E-05	0.00004
PFHpA	0.1	60	1.00E-09	6.00E-09	8	130	16	1.14E-04	16	7.12E-10	2.00E-05	0.00004
PFHxS	0.1	60	1.00E-09	6.00E-09	8	130	16	1.14E-04	16	7.12E-10	2.00E-05	0.00004
PFOA	0.1	60	1.00E-09	6.00E-09	8	130	16	1.14E-04	16	7.12E-10	2.00E-05	0.00004
PFOS	0.1	60	1.00E-09	6.00E-09	8	130	16	1.14E-04	16	7.12E-10	2.00E-05	0.00004
PFNA	0.1	60	1.00E-09	6.00E-09	8	130	16	1.14E-04	16	7.12E-10	2.00E-05	0.00004
Total										HI =	0.00021	

PFAS-6 Action Level Calculations

Constituent Properties

Parameter	Assumed Soil Exposure Point Concentration mg/kg
PFDA	0.1
PFHpA	0.1
PFHxS	0.1
PFOA	0.1
PFOS	0.1
PFNA	0.1

mg/kg = milligrams per kilogram.

PFAS-6 Action Level Calculations

Toxicity Values and Relative Absorption Factors

Constituent	Carcinogenic Weight of Evidence Category ^[1]	Chronic Oral Reference Dose	Subchronic Oral Reference Dose	Chronic Inhalation Reference Concentration	Subchronic Inhalation Reference Concentration	Oral Cancer Slope Factor	Inhalation Unit Risk	Soil Relative Absorption Factors (RAF) ^[2,3]	
		(RfD)	(RfDs)	(RfC)	(RfCs)	(OSF)	(IUR)	(unitless)	
		(mg/kg-dy)	(mg/kg-dy)	(mg/m ³)	(mg/m ³)	(mg/kg-dy) ⁻¹	[(mg/m ³) ⁻¹]	Oral	Dermal
PFDA	Not assessed	5.00E-06 [2]	5.00E-06 [2]	2.00E-05 [2]	2.00E-05 [2]	-	-	1	0.1
PFHpA	Not assessed	5.00E-06 [2]	5.00E-06 [2]	2.00E-05 [2]	2.00E-05 [2]	-	-	1	0.1
PFHxS	Not assessed	5.00E-06 [2]	5.00E-06 [2]	2.00E-05 [2]	2.00E-05 [2]	-	-	1	0.1
PFOA	Not assessed	5.00E-06 [2]	5.00E-06 [2]	2.00E-05 [2]	2.00E-05 [2]	-	-	1	0.1
PFOS	Not assessed	5.00E-06 [2]	5.00E-06 [2]	2.00E-05 [2]	2.00E-05 [2]	-	-	1	0.1
PFNA	Not assessed	5.00E-06 [2]	5.00E-06 [2]	2.00E-05 [2]	2.00E-05 [2]	-	-	1	0.1

- " - " No information available or not applicable.
 mg/kg-dy Milligrams per kilogram of body weight per day.
 mg/m³ Milligrams per cubic meter in air.
- US EPA's Weight of Evidence Category with respect to human carcinogenicity:
 - A = Known human carcinogen
 - B1, B2 = Probable human carcinogen
 - C = Possible human carcinogen
 - D = Not classifiable as to human carcinogenicity
 - MassDEP (2019) Method 1 Numerical Standards and supporting documentation (draft).

Tighe&Bond

APPENDIX D



ANALYTICAL REPORT

Lab Number:	L2305214
Client:	Tighe & Bond, Inc. 53 Southampton Road Westfield, MA 01085
ATTN:	Matthew Wagner
Phone:	(413) 462-1600
Project Name:	GROTON-DUNSTABLE
Project Number:	G-5078
Report Date:	03/08/23

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Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2305214-01	S-34 (0-6")	SOIL	GROTON, MA	01/31/23 10:30	01/31/23
L2305214-02	S-35 (0-6")	SOIL	GROTON, MA	01/31/23 10:50	01/31/23

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

Case Narrative (continued)

Report Revision

March 08, 2023: All non-detect (ND) concentrations have been quantitated to the limit noted in the RL column.

Perfluorinated Alkyl Acids by Isotope Dilution

L2305214-01, -02, WG1744878-3, and WG1744878-4: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2305214-01 and WG1744878-3: The MeOH fraction of the extraction is reported for perfluorooctanesulfonamide (fosa) due to better extraction efficiency of the perfluoro[13c8]octanesulfonamide (m8fosa) Extracted Internal Standard.

The WG1744878-3 MS recovery, performed on L2305214-01, is outside the acceptance criteria for perfluoropentanesulfonic acid (pfpes) (130%) and perfluorotetradecanoic acid (pfta) (134%).

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Michael Chang Michael Chang

Title: Technical Director/Representative

Date: 03/08/23

ORGANICS

SEMIVOLATILES

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305214-01
Client ID: S-34 (0-6")
Sample Location: GROTON, MA

Date Collected: 01/31/23 10:30
Date Received: 01/31/23
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/16/23 13:56
Analyst: PS
Percent Solids: 78%

Extraction Method: ALPHA 23528
Extraction Date: 02/15/23 17:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.590	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.590	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.295	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.18	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.590	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.18	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.295	--	1
Perfluorohexanesulfonic Acid (PFHxS)	0.572		ng/g	0.295	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.295	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.590	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.590	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.295	--	1
Perfluorooctanesulfonic Acid (PFOS)	6.92		ng/g	0.295	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.295	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.590	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.18	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.590	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.590	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.590	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.590	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.590	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.590	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.590	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305214-01
 Client ID: S-34 (0-6")
 Sample Location: GROTON, MA

Date Collected: 01/31/23 10:30
 Date Received: 01/31/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	80		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	88		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	79		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	69		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	74		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	77		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	88		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	86		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	82		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	78		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	84		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	74	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	75		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	62		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	87		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	52		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	71		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	18	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305214-01
 Client ID: S-34 (0-6")
 Sample Location: GROTON, MA

Date Collected: 01/31/23 10:30
 Date Received: 01/31/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/17/23 19:14
 Analyst: JW
 Percent Solids: 78%

Extraction Method: ALPHA 23528
 Extraction Date: 02/15/23 17:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.590	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			82		5-117	

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305214-02
 Client ID: S-35 (0-6")
 Sample Location: GROTON, MA

Date Collected: 01/31/23 10:50
 Date Received: 01/31/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/16/23 14:29
 Analyst: PS
 Percent Solids: 80%

Extraction Method: ALPHA 23528
 Extraction Date: 02/15/23 17:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.557	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.557	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.278	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.11	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.557	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.11	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.278	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.278	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.278	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.557	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.557	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.278	--	1
Perfluorooctanesulfonic Acid (PFOS)	2.19		ng/g	0.278	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.278	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.557	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.11	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.557	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.557	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.557	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.557	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.557	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.557	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.557	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.557	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305214-02
 Client ID: S-35 (0-6")
 Sample Location: GROTON, MA

Date Collected: 01/31/23 10:50
 Date Received: 01/31/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	71		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	78		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	75		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	61		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	66		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	69	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	83		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	82		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	77		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	65	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	80		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	69	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	79		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	55		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	82		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	5		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	48		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	79		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	17	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/16/23 12:50
Analyst: PS

Extraction Method: ALPHA 23528
Extraction Date: 02/15/23 17:45

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1744878-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.500	--
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.500	--
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.00	--
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.500	--
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.00	--
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.250	--
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.250	--
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.500	--
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.500	--
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.250	--
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/g	0.250	--
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.500	--
Perfluorononanesulfonic Acid (PFNS)	ND		ng/g	1.00	--
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.500	--
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.500	--
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.500	--
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	--
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.500	--
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.500	--
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.500	--
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.500	--

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/16/23 12:50
Analyst: PS

Extraction Method: ALPHA 23528
Extraction Date: 02/15/23 17:45

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1744878-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	92		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	108		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	84		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	72		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	88		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	89		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	89		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	92		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	87		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	92		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	91		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	93		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	113		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	83		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	105		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	12		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	90		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	92		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	65		24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/17/23 19:01
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 02/15/23 17:45

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-02 Batch: WG1744878-1					
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	--

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	82		5-117

Lab Control Sample Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305214

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS	Qual	LCSD	Qual	%Recovery	RPD	Qual	RPD
	%Recovery		%Recovery		Limits			Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 Batch: WG1744878-2								
Perfluorobutanoic Acid (PFBA)	110		-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	110		-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	106		-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	121		-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	112		-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	120		-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	113		-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	111		-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	103		-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	122		-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	105		-		70-132	-		30
Perfluorononanoic Acid (PFNA)	104		-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	108		-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	99		-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	122		-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	120		-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	101		-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	113		-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	132		-		59-134	-		30
Perfluorooctanesulfonamide (FOSA)	114		-		67-137	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	115		-		61-139	-		30
Perfluorododecanoic Acid (PFDoA)	110		-		69-135	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305214

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS		LCSD		%Recovery		RPD	
	%Recovery	Qual	%Recovery	Qual	Limits	RPD	Qual	Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 Batch: WG1744878-2								
Perfluorotridecanoic Acid (PFTrDA)	115		-		66-139	-		30
Perfluorotetradecanoic Acid (PFTA)	115		-		69-133	-		30

Surrogate (Extracted Internal Standard)	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Perfluoro[13C4]Butanoic Acid (MPFBA)	92				61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	100				58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	81				74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	70				14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	78				66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	79				71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87				78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	97				75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	84				20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	86				72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	85				79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	88				75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	97				19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	95				31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	94				61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	11				5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	80				34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	99				54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	69				24-159

Lab Control Sample Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305214

Report Date: 03/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 Batch: WG1744878-2								
Perfluorooctanesulfonamide (FOSA)	104		-		67-137	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	75				5-117

Matrix Spike Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305214

Project Number: G-5078

Report Date: 03/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1744878-3 QC Sample: L2305214-01 Client ID: S-34 (0-6")												
Perfluorobutanoic Acid (PFBA)	ND	6.02	6.54	107		-	-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	ND	6.02	6.42	105		-	-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	ND	5.35	5.70	107		-	-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	5.65	7.01	124		-	-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	ND	6.02	6.66	109		-	-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	5.67	7.38	130	Q	-	-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	ND	6.02	6.42	106		-	-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	0.572	5.51	6.48	107		-	-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	ND	6.02	7.35	120		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	5.74	6.98	122		-	-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	5.75	6.07	106		-	-		70-132	-		30
Perfluorononanoic Acid (PFNA)	ND	6.02	6.05	99		-	-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	6.92	5.59	11.7	86		-	-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	ND	6.02	6.10	99		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	5.78	7.53	130		-	-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	ND	5.8	6.11	105		-	-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	6.02	6.95	115		-	-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	6.02	5.72	94		-	-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	ND	5.82	6.02	103		-	-		59-134	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	6.02	5.60	93		-	-		61-139	-		30
Perfluorododecanoic Acid (PFDoA)	ND	6.02	7.16	119		-	-		69-135	-		30
Perfluorotridecanoic Acid (PFTrDA)	ND	6.02	7.98	132		-	-		66-139	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305214

Project Number: G-5078

Report Date: 03/08/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1744878-3 QC Sample: L2305214-01 Client ID: S-34 (0-6")												
Perfluorotetradecanoic Acid (PFTA)	ND	6.02	8.08F	134	Q	-	-		69-133	-		30

<i>Surrogate (Extracted Internal Standard)</i>	<i>MS</i>		<i>MSD</i>		<i>Acceptance Criteria</i>
	<i>% Recovery</i>	<i>Qualifier</i>	<i>% Recovery</i>	<i>Qualifier</i>	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	69				19-175
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	60				14-167
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	75				20-154
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	46				34-137
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	46				31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	88				61-155
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	76				75-130
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	66				66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	70	Q			71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	75	Q			78-139
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	77				54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	17	Q			24-159
Perfluoro[13C4]Butanoic Acid (MPFBA)	73				61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	81				58-150
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	72	Q			79-136
Perfluoro[13C8]Octanoic Acid (M8PFOA)	71	Q			75-130
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	75				72-140
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	70	Q			74-139

Matrix Spike Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305214

Project Number: G-5078

Report Date: 03/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1744878-3 QC Sample: L2305214-01 Client ID: S-34 (0-6")												
Perfluorooctanesulfonamide (FOSA)	ND	6.02	6.42	107		-	-		67-137	-		30

Surrogate (Extracted Internal Standard)	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	75				5-117

Lab Duplicate Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305214

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1744878-4 QC Sample: L2305214-02 Client ID: S-35 (0-6")						
Perfluorobutanoic Acid (PFBA)	ND	ND	ng/g	NC		30
Perfluoropentanoic Acid (PFPeA)	ND	ND	ng/g	NC		30
Perfluorobutanesulfonic Acid (PFBS)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/g	NC		30
Perfluorohexanoic Acid (PFHxA)	ND	ND	ng/g	NC		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	ND	ng/g	NC		30
Perfluoroheptanoic Acid (PFHpA)	ND	ND	ng/g	NC		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	ND	ng/g	NC		30
Perfluorooctanoic Acid (PFOA)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/g	NC		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/g	NC		30
Perfluorononanoic Acid (PFNA)	ND	ND	ng/g	NC		30
Perfluorooctanesulfonic Acid (PFOS)	2.19	2.34	ng/g	7		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/g	NC		30
Perfluorononanesulfonic Acid (PFNS)	ND	ND	ng/g	NC		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	ND	ng/g	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/g	NC		30
Perfluorodecanesulfonic Acid (PFDS)	ND	ND	ng/g	NC		30
Perfluorooctanesulfonamide (FOSA)	ND	ND	ng/g	NC		30

Lab Duplicate Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305214

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1744878-4 QC Sample: L2305214-02 Client ID: S-35 (0-6")						
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	ND	ng/g	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/g	NC		30
Perfluorotridecanoic Acid (PFTTrDA)	ND	ND	ng/g	NC		30
Perfluorotetradecanoic Acid (PFTA)	ND	ND	ng/g	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	71		62		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	78		69		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	75		73	Q	74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	61		59		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	66		62	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	69	Q	68	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	83		79		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	82		77		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	77		74		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	65	Q	79		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	80		73	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	69	Q	71	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	79		77		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	55		50		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	82		86		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	48		44		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	79		86		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	17	Q	8	Q	24-159

INORGANICS & MISCELLANEOUS

Project Name: GROTON-DUNSTABLE

Lab Number: L2305214

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305214-01

Date Collected: 01/31/23 10:30

Client ID: S-34 (0-6")

Date Received: 01/31/23

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	78.3		%	0.100	--	1	-	02/01/23 10:23	121,2540G	VAM



Project Name: GROTON-DUNSTABLE

Lab Number: L2305214

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305214-02

Date Collected: 01/31/23 10:50

Client ID: S-35 (0-6")

Date Received: 01/31/23

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	80.2		%	0.100	--	1	-	02/01/23 10:23	121,2540G	VAM



Lab Duplicate Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305214

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01-02 QC Batch ID: WG1739626-1 QC Sample: L2305132-12 Client ID: DUP Sample						
Solids, Total	82.9	84.0	%	1		10

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Serial_No:03082315:27

Lab Number: L2305214

Report Date: 03/08/23

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information

Cooler **Custody Seal**

A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2305214-01A	Plastic 8oz unpreserved	A	NA		4.3	Y	Absent		A2-537-ISOTOPE(90)
L2305214-01B	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		A2-TS(7)
L2305214-02A	Plastic 8oz unpreserved	A	NA		4.3	Y	Absent		A2-537-ISOTOPE(90)
L2305214-02B	Plastic 2oz unpreserved for TS	A	NA		4.3	Y	Absent		A2-TS(7)

PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
PERFLUOROALKYL CARBOXYLIC ACIDS (PFCAs)		
Perfluorooctadecanoic Acid	PFODA	16517-11-6
Perfluorohexadecanoic Acid	PFHxDA	67905-19-5
Perfluorotetradecanoic Acid	PFTA/PFTeDA	376-06-7
Perfluorotridecanoic Acid	PFTrDA	72629-94-8
Perfluorododecanoic Acid	PFDoA	307-55-1
Perfluoroundecanoic Acid	PFUnA	2058-94-8
Perfluorodecanoic Acid	PFDA	335-76-2
Perfluorononanoic Acid	PFNA	375-95-1
Perfluorooctanoic Acid	PFOA	335-67-1
Perfluoroheptanoic Acid	PFHpA	375-85-9
Perfluorohexanoic Acid	PFHxA	307-24-4
Perfluoropentanoic Acid	PFPeA	2706-90-3
Perfluorobutanoic Acid	PFBA	375-22-4
PERFLUOROALKYL SULFONIC ACIDS (PFSAs)		
Perfluorododecanesulfonic Acid	PFDoDS/PFDoS	79780-39-5
Perfluorodecanesulfonic Acid	PFDS	335-77-3
Perfluorononanesulfonic Acid	PFNS	68259-12-1
Perfluorooctanesulfonic Acid	PFOS	1763-23-1
Perfluoroheptanesulfonic Acid	PFHpS	375-92-8
Perfluorohexanesulfonic Acid	PFHxS	355-46-4
Perfluoropentanesulfonic Acid	PFPeS	2706-91-4
Perfluorobutanesulfonic Acid	PFBS	375-73-5
Perfluoropropanesulfonic Acid	PFPrS	423-41-6
FLUOROTELOMERS		
1H,1H,2H,2H-Perfluorododecanesulfonic Acid	10:2FTS	120226-60-0
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	8:2FTS	39108-34-4
1H,1H,2H,2H-Perfluorooctanesulfonic Acid	6:2FTS	27619-97-2
1H,1H,2H,2H-Perfluorohexanesulfonic Acid	4:2FTS	757124-72-4
PERFLUOROALKANE SULFONAMIDES (FASAs)		
Perfluorooctanesulfonamide	FOSA/PFOSA	754-91-6
N-Ethyl Perfluorooctane Sulfonamide	NEtFOSA	4151-50-2
N-Methyl Perfluorooctane Sulfonamide	NMeFOSA	31506-32-8
PERFLUOROALKANE SULFONYL SUBSTANCES		
N-Ethyl Perfluorooctanesulfonamido Ethanol	NEtFOSE	1691-99-2
N-Methyl Perfluorooctanesulfonamido Ethanol	NMeFOSE	24448-09-7
N-Ethyl Perfluorooctanesulfonamidoacetic Acid	NEtFOSAA	2991-50-6
N-Methyl Perfluorooctanesulfonamidoacetic Acid	NMeFOSAA	2355-31-9
PER- and POLYFLUOROALKYL ETHER CARBOXYLIC ACIDS		
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid	HFPO-DA	13252-13-6
4,8-Dioxa-3h-Perfluorononanoic Acid	ADONA	919005-14-4
CHLORO-PERFLUOROALKYL SULFONIC ACIDS		
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid	11Cl-PF3OUdS	763051-92-9
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	9Cl-PF3ONS	756426-58-1
PERFLUOROETHER SULFONIC ACIDS (PFESAs)		
Perfluoro(2-Ethoxyethane)Sulfonic Acid	PFEESA	113507-82-7
PERFLUOROETHER/POLYETHER CARBOXYLIC ACIDS (PFPCAs)		
Perfluoro-3-Methoxypropanoic Acid	PFMPA	377-73-1
Perfluoro-4-Methoxybutanoic Acid	PFMBA	863090-89-5
Nonafluoro-3,6-Dioxaheptanoic Acid	NFDHA	151772-58-6

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Serial_No:03082315:27
Lab Number: L2305214

Report Date: 03/08/23

PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
FLUOROTELOMER CARBOXYLIC ACIDS (FTCAs)		
3-Perfluoroheptyl Propanoic Acid	7:3FTCA	812-70-4
2H,2H,3H,3H-Perfluorooctanoic Acid	5:3FTCA	914637-49-3
3-Perfluoropropyl Propanoic Acid	3:3FTCA	356-02-5

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report



Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

Data Qualifiers

- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305214
Report Date: 03/08/23

REFERENCES

- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.

CHAIN OF CUSTODY

PAGE 1 OF 1



WESTBORO, MA
TEL: 508-898-9220
FAX: 508-898-9193

MANSFIELD, MA
TEL: 508-822-9300
FAX: 508-822-3288

Project Information

Project Name: Groton-Dunstable
 Project Location: Groton, MA
 Project #: G-5078
 Project Manager: Matt Wagner
 ALPHA Quote #:

Date Rec'd in Lab: 1/31/23

ALPHA Job #: L2305214

Report Information - Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

Same as Client info PO #: G-5078

Client Information

Client: Tight+Bond
 Address: 53 Southampton Rd
Nestfield MA 01085
 Phone: 413-562-1600
 Fax:
 Email: MGWagner@Tightbond.com
 These samples have been previously analyzed by Alpha

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)

Date Due: 2/21/23 Time:

or sooner

Other Project Specific Requirements/Comments/Detection Limits:

Regulatory Requirements/Report Limits

State/Fed Program MCP Criteria S-1/GW-1 / RCS-1

ANALYSIS
PFAS - Isotope Dil'n

SAMPLE HANDLING

Filtration _____
 Done
 Not needed
 Lab to do
 Preservation
 Lab to do
 (Please specify below)

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials				Sample Specific Comments
		Date	Time						
<u>05214-01</u>	<u>S-34 (0-6")</u>	<u>1/31/23</u>	<u>1030</u>	<u>S</u>	<u>NG</u>	<input checked="" type="checkbox"/>			
<u>-02</u>	<u>S-35 (0-6")</u>	<u>1/31/23</u>	<u>1050</u>	<u>S</u>	<u>NG</u>	<input checked="" type="checkbox"/>			

Container Type	<u>P</u>
Preservative	<u>I</u>

Relinquished By:	Date/Time	Received By:	Date/Time
<u>[Signature]</u>	<u>1/31/23 1250</u>	<u>[Signature]</u> <u>AMZ</u>	<u>1/31/23 1250</u>
<u>[Signature]</u>	<u>1-31-23 15:00</u>	<u>[Signature]</u> <u>Exc Wood</u>	<u>1/31/23 1559</u>
<u>[Signature]</u>	<u>1/31/23</u>	<u>[Signature]</u>	<u>1/31/23 1602</u>

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.



ANALYTICAL REPORT

Lab Number:	L2305132
Client:	Tighe & Bond, Inc. 53 Southampton Road Westfield, MA 01085
ATTN:	Matthew Wagner
Phone:	(413) 462-1600
Project Name:	GROTON-DUNSTABLE
Project Number:	G-5078
Report Date:	03/08/23

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305132

Report Date: 03/08/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2305132-01	S-19 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 10:15	01/30/23
L2305132-02	S-20 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 10:45	01/30/23
L2305132-03	S-21 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 11:15	01/30/23
L2305132-04	S-22 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 11:40	01/30/23
L2305132-05	S-23 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 12:30	01/30/23
L2305132-06	S-24 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 13:40	01/30/23
L2305132-07	S-25 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 13:15	01/30/23
L2305132-08	S-26 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 14:10	01/30/23
L2305132-09	S-27 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 14:30	01/30/23
L2305132-10	S-28 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 15:00	01/30/23
L2305132-11	S-29 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 15:20	01/30/23
L2305132-12	S-30 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 16:00	01/30/23
L2305132-13	S-31 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 16:10	01/30/23
L2305132-14	S-32 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 16:30	01/30/23
L2305132-15	S-33 (0-6")	SOIL	703 CHICOPEE ROW	01/30/23 17:00	01/30/23
L2305132-16	FIELD BLANK	WATER	703 CHICOPEE ROW	01/30/23 17:03	01/30/23
L2305132-17	EQUIPMENT BLANK	WATER	703 CHICOPEE ROW	01/30/23 17:05	01/30/23

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Case Narrative (continued)

Report Revision

March 08, 2023: All non-detect (ND) concentrations have been quantitated to the limit noted in the RL column.

Perfluorinated Alkyl Acids by Isotope Dilution

L2305132-01, -02, -02RE, -03, -04, -05, -06, -07, -08, -09, -10, -11, -12, -14, -15, WG1743980-3 and WG1743980-4: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2305132-02, -05, -06, -08, -10, -12, -15 and WG1743980-4: The MeOH fraction of the extraction is reported for perfluorooctanesulfonamide (fosa) due to better extraction efficiency of the perfluoro[13c8]octanesulfonamide (m8fosa) Extracted Internal Standard.

L2305132-02: The Extracted Internal Standard recoveries were less than 5% for perfluoro[1,2-13c2]tetradecanoic acid (m2pfteda) (3%); however, the criteria were achieved upon re-extraction at a lower volume. The results of the re-extraction are reported for the associated target compounds.

L2305132-02RE: The sample has elevated detection limits due to the limited sample volume utilized during extraction, as required by the sample matrix.

L2305132-15: The Extracted Internal Standard recoveries are less than 5% for perfluoro[1,2-13c2]tetradecanoic acid (m2pfteda) (3%); however, re-extraction at a lower volume confirmed the original result. The results of the original extraction are reported for the associated target compounds.

WG1743980-3: The Extracted Internal Standard recovery for the WG1743980-3 MS, performed on L2305132-01, is below the acceptance criteria (less than 5%) for perfluoro[13c8]octanesulfonamide (m8fosa) (2%); however, all associated target analytes are within MS criteria; therefore, no further action was taken.

WG1743980-4: The Extracted Internal Standard recoveries are less than 2% for perfluoro[1,2-13c2]tetradecanoic acid (m2pfteda) (1%). The associated target compounds are not reported due to the insufficient recovery.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:  Michael Chang

Title: Technical Director/Representative

Date: 03/08/23

ORGANICS

SEMIVOLATILES

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-01
Client ID: S-19 (0-6")
Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 10:15
Date Received: 01/30/23
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/14/23 14:51
Analyst: AC
Percent Solids: 69%

Extraction Method: ALPHA 23528
Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.690	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.690	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.345	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.38	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.690	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.38	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.345	--	1
Perfluorohexanesulfonic Acid (PFHxS)	0.387		ng/g	0.345	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.345	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.690	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.690	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.345	--	1
Perfluorooctanesulfonic Acid (PFOS)	2.62		ng/g	0.345	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.345	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.690	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.38	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.690	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.690	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.690	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.690	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.690	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.690	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.690	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.690	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-01
 Client ID: S-19 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 10:15
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	61		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	64		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	67	Q	74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	69		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	54	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	56	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	66	Q	78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	63	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	76		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	60	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	59	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	60	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	73		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	26	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	57	Q	61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	6		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	25	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	46	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	9	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-02
 Client ID: S-20 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 10:45
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/14/23 15:24
 Analyst: AC
 Percent Solids: 83%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.549	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.549	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.274	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.10	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.549	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.10	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.274	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.274	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.274	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.549	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.549	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.274	--	1
Perfluorooctanesulfonic Acid (PFOS)	3.51		ng/g	0.274	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.274	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.549	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.10	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.549	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.549	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.549	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.549	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.549	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-02
 Client ID: S-20 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 10:45
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	72		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	72		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	75		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	75		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	60	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	63	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	75	Q	78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	68	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	84		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	63	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	66	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	64	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	86		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	19	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	58	Q	61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	13	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	42	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	3	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-02
 Client ID: S-20 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 10:45
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/15/23 14:12
 Analyst: JW
 Percent Solids: 83%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab

Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.549	--	1
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Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	82		5-117

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-02 RE
 Client ID: S-20 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 10:45
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/16/23 13:23
 Analyst: PS
 Percent Solids: 83%

Extraction Method: ALPHA 23528
 Extraction Date: 02/15/23 17:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	1.71	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	1.71	--	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	62		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	6	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-03
Client ID: S-21 (0-6")
Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 11:15
Date Received: 01/30/23
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/14/23 15:57
Analyst: AC
Percent Solids: 80%

Extraction Method: ALPHA 23528
Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.580	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.580	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.290	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.16	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.580	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.16	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.290	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.290	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.290	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.580	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.580	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.290	--	1
Perfluorooctanesulfonic Acid (PFOS)	6.56		ng/g	0.290	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.290	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.580	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.16	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.580	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.580	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.580	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.580	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.580	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.580	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.580	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.580	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-03
 Client ID: S-21 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 11:15
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	77		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	79		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	85		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	87		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	72		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	75		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	84		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	81		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	98		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	78		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	80		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	74	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	105		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	35		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	78		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	11		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	39		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	65		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	9	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-04
 Client ID: S-22 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 11:40
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/14/23 16:14
 Analyst: AC
 Percent Solids: 73%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.636	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.636	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.318	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.27	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.636	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.27	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.318	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.318	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.318	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.636	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.636	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.318	--	1
Perfluorooctanesulfonic Acid (PFOS)	3.61		ng/g	0.318	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.318	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.636	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.27	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.636	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.636	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.636	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.636	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.636	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.636	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.636	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.636	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-04
 Client ID: S-22 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 11:40
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	62		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	64		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	68	Q	74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	70		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	56	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	58	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	69	Q	78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	65	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	76		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	57	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	63	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	57	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	78		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	28	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	63		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	6		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	20	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	46	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	5	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-05
Client ID: S-23 (0-6")
Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 12:30
Date Received: 01/30/23
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/14/23 16:30
Analyst: AC
Percent Solids: 79%

Extraction Method: ALPHA 23528
Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.594	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.594	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.297	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.19	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.594	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.19	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.297	--	1
Perfluorohexanesulfonic Acid (PFHxS)	0.474		ng/g	0.297	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.297	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.594	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.594	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.297	--	1
Perfluorooctanesulfonic Acid (PFOS)	3.96		ng/g	0.297	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.297	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.594	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.19	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.594	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.594	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.594	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.594	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.594	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.594	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.594	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-05
 Client ID: S-23 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 12:30
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	72		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	74		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	77		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	80		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	63	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	65	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	77	Q	78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	74	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	89		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	68	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	72	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	68	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	102		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	43		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	73		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	38		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	59		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	8	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-05
 Client ID: S-23 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 12:30
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/15/23 14:24
 Analyst: JW
 Percent Solids: 79%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab

Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.594	--	1
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Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	82		5-117

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-06
Client ID: S-24 (0-6")
Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 13:40
Date Received: 01/30/23
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/14/23 16:47
Analyst: AC
Percent Solids: 85%

Extraction Method: ALPHA 23528
Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.541	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.541	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.270	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.08	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.541	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.08	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.270	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.270	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.270	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.541	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.541	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.270	--	1
Perfluorooctanesulfonic Acid (PFOS)	1.04		ng/g	0.270	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.270	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.541	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.08	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.541	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.541	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.541	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.541	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.541	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.541	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.541	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-06
 Client ID: S-24 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 13:40
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	57	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	59		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	65	Q	74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	64		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	49	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	51	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	63	Q	78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	58	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	73		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	53	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	54	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	50	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	75		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	20	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	46	Q	61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	23	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	35	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	5	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-06
 Client ID: S-24 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 13:40
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/15/23 14:31
 Analyst: JW
 Percent Solids: 85%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.541	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			92		5-117	

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-07
 Client ID: S-25 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 13:15
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/14/23 17:03
 Analyst: AC
 Percent Solids: 69%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.656	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.656	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.328	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.31	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.656	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.31	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.328	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.328	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.328	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.656	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.656	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.328	--	1
Perfluorooctanesulfonic Acid (PFOS)	6.44		ng/g	0.328	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.328	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.656	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.31	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.656	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.656	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.656	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.656	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.656	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.656	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.656	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.656	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-07
 Client ID: S-25 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 13:15
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	66		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	68		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	78		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	81		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	60	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	63	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	80		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	72	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	89		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	68	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	72	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	67	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	102		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	40		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	70		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	8		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	38		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	61		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	13	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-08
 Client ID: S-26 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 14:10
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/14/23 17:20
 Analyst: AC
 Percent Solids: 81%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.574	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.574	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.287	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.15	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.574	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.15	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.287	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.287	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.287	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.574	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.574	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.287	--	1
Perfluorooctanesulfonic Acid (PFOS)	3.57		ng/g	0.287	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.287	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.574	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.15	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.574	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.574	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.574	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.574	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.574	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.574	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.574	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-08
 Client ID: S-26 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 14:10
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	59	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	60		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	68	Q	74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	69		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	52	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	55	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	68	Q	78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	62	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	76		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	56	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	62	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	58	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	80		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	31		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	55	Q	61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	27	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	47	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	9	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-08
 Client ID: S-26 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 14:10
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/15/23 14:37
 Analyst: JW
 Percent Solids: 81%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab

Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.574	--	1
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Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	86		5-117

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-09
 Client ID: S-27 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 14:30
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/14/23 17:36
 Analyst: AC
 Percent Solids: 78%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.608	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.608	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.304	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.22	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.608	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.22	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.304	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.304	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.304	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.608	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.608	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.304	--	1
Perfluorooctanesulfonic Acid (PFOS)	3.78		ng/g	0.304	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.304	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.608	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.22	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.608	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.608	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.608	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.608	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.608	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.608	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.608	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.608	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-09
 Client ID: S-27 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 14:30
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	70		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	73		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	77		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	79		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	61	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	63	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	74	Q	78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	71	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	89		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	67	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	73	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	68	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	101		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	43		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	70		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	7		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	41		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	61		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	21	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-10
 Client ID: S-28 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 15:00
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/14/23 17:53
 Analyst: AC
 Percent Solids: 66%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.716	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.716	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.358	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.43	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.716	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.43	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.358	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.358	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.358	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.716	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.716	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.358	--	1
Perfluorooctanesulfonic Acid (PFOS)	4.45		ng/g	0.358	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.358	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.716	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.43	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.716	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.716	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.716	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.716	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.716	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.716	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.716	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-10
 Client ID: S-28 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 15:00
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	59	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	61		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	67	Q	74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	69		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	51	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	53	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	67	Q	78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	59	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	76		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	54	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	58	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	54	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	77		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	26	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	55	Q	61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	23	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	42	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	10	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-10
 Client ID: S-28 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 15:00
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/15/23 14:43
 Analyst: JW
 Percent Solids: 66%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.716	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			87		5-117	

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-11
Client ID: S-29 (0-6")
Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 15:20
Date Received: 01/30/23
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/14/23 19:53
Analyst: AC
Percent Solids: 63%

Extraction Method: ALPHA 23528
Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.754	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.754	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.377	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.51	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.754	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.51	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.377	--	1
Perfluorohexanesulfonic Acid (PFHxS)	0.514		ng/g	0.377	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.377	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.754	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.754	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.377	--	1
Perfluorooctanesulfonic Acid (PFOS)	12.3		ng/g	0.377	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.377	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.754	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.51	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.754	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.754	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.754	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.754	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.754	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.754	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.754	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.754	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-11
 Client ID: S-29 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 15:20
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	56	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	57	Q	58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	81		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	80		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	51	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	55	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	82		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	65	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	93		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	65	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	75	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	66	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	108		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	32		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	68		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	7		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	31	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	61		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	23	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-12
 Client ID: S-30 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 16:00
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/14/23 20:09
 Analyst: AC
 Percent Solids: 83%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.555	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.555	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.277	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.11	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.555	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.11	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.277	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.277	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.277	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.555	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.555	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.277	--	1
Perfluorooctanesulfonic Acid (PFOS)	10.8		ng/g	0.277	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.277	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.555	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.11	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.555	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.555	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.555	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.555	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.555	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.555	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.555	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-12
 Client ID: S-30 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 16:00
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	64		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	67		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	79		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	83		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	54	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	58	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	78		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	71	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	150		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	65	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	74	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	70	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	140		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	51		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	74		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	59		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	62		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	29		24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-12
 Client ID: S-30 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 16:00
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/15/23 14:50
 Analyst: JW
 Percent Solids: 83%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab

Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.555	--	1
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Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
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Perfluoro[13C8]Octanesulfonamide (M8FOSA)	82		5-117
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Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-13
Client ID: S-31 (0-6")
Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 16:10
Date Received: 01/30/23
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/14/23 20:26
Analyst: AC
Percent Solids: 80%

Extraction Method: ALPHA 23528
Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.601	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.601	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.300	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.20	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.601	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.20	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.300	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.300	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.300	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.601	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.601	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.300	--	1
Perfluorooctanesulfonic Acid (PFOS)	7.82		ng/g	0.300	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.300	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.601	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.20	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.601	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.601	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.601	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.601	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.601	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.601	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.601	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.601	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-13
 Client ID: S-31 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 16:10
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	80		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	82		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	88		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	71		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	76		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	85		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	102		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	78		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	79		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	78		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	111		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	50		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	80		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	6		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	44		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	67		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	26		24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-14
 Client ID: S-32 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 16:30
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/14/23 20:43
 Analyst: AC
 Percent Solids: 68%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.654	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.654	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.327	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.31	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.654	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.31	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.327	--	1
Perfluorohexanesulfonic Acid (PFHxS)	0.334		ng/g	0.327	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.327	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.654	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.654	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.327	--	1
Perfluorooctanesulfonic Acid (PFOS)	3.79		ng/g	0.327	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.327	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.654	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.31	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.654	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.654	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.654	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.654	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.654	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.654	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.654	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.654	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-14
 Client ID: S-32 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 16:30
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	73		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	75		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	81		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	83		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	65	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	67	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	81		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	77		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	94		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	70	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	75	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	71	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	100		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	41		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	73		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	5		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	36		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	58		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	11	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-15
 Client ID: S-33 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 17:00
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/14/23 20:59
 Analyst: AC
 Percent Solids: 61%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.773	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.773	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.386	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.54	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.773	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.54	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.386	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.386	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.386	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.773	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.773	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.386	--	1
Perfluorooctanesulfonic Acid (PFOS)	2.89		ng/g	0.386	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.386	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.773	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.54	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.773	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.773	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.773	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.773	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.773	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.773	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.773	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-15
 Client ID: S-33 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 17:00
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	54	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	56	Q	58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	61	Q	74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	59		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	47	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	50	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	58	Q	78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	55	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	67		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	50	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	50	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	44	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	59		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	17	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	40	Q	61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	13	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	30	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	3	Q	24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-15
 Client ID: S-33 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 17:00
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/15/23 15:02
 Analyst: JW
 Percent Solids: 61%

Extraction Method: ALPHA 23528
 Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.773	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			91		5-117	

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-16
Client ID: FIELD BLANK
Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 17:03
Date Received: 01/30/23
Field Prep: Not Specified

Sample Depth:

Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/11/23 16:28
Analyst: SG

Extraction Method: ALPHA 23528
Extraction Date: 02/10/23 20:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.94	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.94	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.94	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.94	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.94	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.94	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.94	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.94	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.94	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.94	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.94	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.94	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.94	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.94	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.94	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/l	1.94	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.94	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.94	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.94	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.94	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.94	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.94	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.94	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.94	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-16
 Client ID: FIELD BLANK
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 17:03
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	86		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	96		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	79		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	59		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	72		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	76		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	83		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	83		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	69		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	79		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	81		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	85		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	86		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	75		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	98		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	44		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	78		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	88		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	89		22-136

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-17
 Client ID: EQUIPMENT BLANK
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 17:05
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 02/11/23 16:45
 Analyst: SG

Extraction Method: ALPHA 23528
 Extraction Date: 02/10/23 20:05

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.84	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.84	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.84	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.84	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.84	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.84	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.84	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.84	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.84	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.84	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.84	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.84	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.84	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.84	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.84	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/l	1.84	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.84	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.84	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.84	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.84	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.84	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.84	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.84	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.84	--	1

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-17
 Client ID: EQUIPMENT BLANK
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 17:05
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	90		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	97		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	84		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	66		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	80		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	87		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	89		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	90		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	80		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	81		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	90		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	98		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	121		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	92		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	125		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	47		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	62		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	113		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	99		22-136

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/11/23 13:09
Analyst: SG

Extraction Method: ALPHA 23528
Extraction Date: 02/10/23 20:05

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 16-17 Batch: WG1743275-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	--
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	--
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	--
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	--
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	--
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	--
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	--
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	--
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	--
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	--
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	--
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	--
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	2.00	--
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	--
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	--
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	--
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	--
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	--
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	--
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.00	--
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	--

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/11/23 13:09
Analyst: SG

Extraction Method: ALPHA 23528
Extraction Date: 02/10/23 20:05

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 16-17 Batch: WG1743275-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	90		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	96		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	85		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	67		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	79		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	85		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	91		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	89		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	74		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	77		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	89		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	91		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	86		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	71		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	102		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	44		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	78		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	87		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	72		22-136

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/13/23 14:41
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 02/10/23 20:05

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 16-17 Batch: WG1743275-1					
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	--

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	70		5-112

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/14/23 14:18
Analyst: AC

Extraction Method: ALPHA 23528
Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-15 Batch: WG1743980-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.500	--
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.500	--
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.00	--
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.500	--
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.00	--
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.250	--
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.250	--
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.500	--
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.500	--
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.250	--
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/g	0.250	--
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.500	--
Perfluorononanesulfonic Acid (PFNS)	ND		ng/g	1.00	--
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.500	--
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.500	--
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.500	--
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	--
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.500	--
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.500	--
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.500	--
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.500	--

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/14/23 14:18
Analyst: AC

Extraction Method: ALPHA 23528
Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-15 Batch: WG1743980-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	85		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	90		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	89		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	73		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	75		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	85		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	85		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	103		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	78		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	83		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	80		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	124		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	71		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	84		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	5		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	72		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	77		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	74		24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/15/23 14:00
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 02/13/23 17:17

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-15 Batch: WG1743980-1					
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	--

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	87		5-117

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/16/23 12:50
Analyst: PS

Extraction Method: ALPHA 23528
Extraction Date: 02/15/23 17:45

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 02 Batch: WG1744878-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.500	--
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.500	--
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.00	--
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.500	--
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.00	--
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.250	--
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.250	--
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.500	--
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.500	--
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.250	--
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/g	0.250	--
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.500	--
Perfluorononanesulfonic Acid (PFNS)	ND		ng/g	1.00	--
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.500	--
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.500	--
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.500	--
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	--
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.500	--
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.500	--
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.500	--
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.500	--

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/16/23 12:50
Analyst: PS

Extraction Method: ALPHA 23528
Extraction Date: 02/15/23 17:45

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 02 Batch: WG1744878-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	92		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	108		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	84		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	72		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	88		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	89		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	89		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	92		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	87		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	92		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	91		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	93		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	113		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	83		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	105		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	12		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	90		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	92		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	65		24-159

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 02/17/23 19:01
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 02/15/23 17:45

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 02 Batch: WG1744878-1					
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	--

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	82		5-117

Lab Control Sample Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 16-17 Batch: WG1743275-2								
Perfluorobutanoic Acid (PFBA)	103		-		67-148	-		30
Perfluoropentanoic Acid (PFPeA)	104		-		63-161	-		30
Perfluorobutanesulfonic Acid (PFBS)	101		-		65-157	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	116		-		37-219	-		30
Perfluorohexanoic Acid (PFHxA)	103		-		69-168	-		30
Perfluoropentanesulfonic Acid (PFPeS)	105		-		52-156	-		30
Perfluoroheptanoic Acid (PFHpA)	103		-		58-159	-		30
Perfluorohexanesulfonic Acid (PFHxS)	105		-		69-177	-		30
Perfluorooctanoic Acid (PFOA)	105		-		63-159	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	113		-		49-187	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	100		-		61-179	-		30
Perfluorononanoic Acid (PFNA)	98		-		68-171	-		30
Perfluorooctanesulfonic Acid (PFOS)	97		-		52-151	-		30
Perfluorodecanoic Acid (PFDA)	81		-		63-171	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	109		-		56-173	-		30
Perfluorononanesulfonic Acid (PFNS)	111		-		48-150	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	110		-		60-166	-		30
Perfluoroundecanoic Acid (PFUnA)	82		-		60-153	-		30
Perfluorodecanesulfonic Acid (PFDS)	123		-		38-156	-		30
Perfluorooctanesulfonamide (FOSA)	106		-		46-170	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	101		-		45-170	-		30
Perfluorododecanoic Acid (PFDoA)	117		-		67-153	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS		LCSD		%Recovery		RPD	
	%Recovery	Qual	%Recovery	Qual	Limits	RPD	Qual	Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 16-17 Batch: WG1743275-2								
Perfluorotridecanoic Acid (PFTrDA)	122		-		48-158	-		30
Perfluorotetradecanoic Acid (PFTA)	106		-		59-182	-		30

Surrogate (Extracted Internal Standard)	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Perfluoro[13C4]Butanoic Acid (MPFBA)	91				58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	97				62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	85				70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	72				12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	77				57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	84				60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87				71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	87				62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	78				14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	83				59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	85				69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	94				62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	94				10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	83				24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	110				55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	51				5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	85				27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	91				48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	97				22-136

Lab Control Sample Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305132

Report Date: 03/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 16-17 Batch: WG1743275-2								
Perfluorooctanesulfonamide (FOSA)	100		-		46-170	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	70				5-112

Lab Control Sample Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-15 Batch: WG1743980-2								
Perfluorobutanoic Acid (PFBA)	97		-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	99		-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	97		-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	113		-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	97		-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	114		-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	99		-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	123		-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	95		-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	108		-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	102		-		70-132	-		30
Perfluorononanoic Acid (PFNA)	107		-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	108		-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	98		-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	118		-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	101		-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	118		-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	98		-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	106		-		59-134	-		30
Perfluorooctanesulfonamide (FOSA)	92		-		67-137	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	107		-		61-139	-		30
Perfluorododecanoic Acid (PFDoA)	92		-		69-135	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS		LCSD		%Recovery		RPD	
	%Recovery	Qual	%Recovery	Qual	Limits	RPD	Qual	Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-15 Batch: WG1743980-2								
Perfluorotridecanoic Acid (PFTrDA)	115		-		66-139	-		30
Perfluorotetradecanoic Acid (PFTA)	103		-		69-133	-		30

Surrogate (Extracted Internal Standard)	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Perfluoro[13C4]Butanoic Acid (MPFBA)	88				61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	87				58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	89				74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	90				14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	76				66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	76				71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	86				78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	87				75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	112				20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	80				72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	87				79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	84				75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	120				19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	73				31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	89				61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	10				5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	76				34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	87				54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	72				24-159

Lab Control Sample Analysis Batch Quality Control

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-15 Batch: WG1743980-2								
Perfluorooctanesulfonamide (FOSA)	97		-		67-137	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	102				5-117

Lab Control Sample Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02 Batch: WG1744878-2								
Perfluorobutanoic Acid (PFBA)	110		-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	110		-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	106		-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	121		-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	112		-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	120		-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	113		-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	111		-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	103		-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	122		-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	105		-		70-132	-		30
Perfluorononanoic Acid (PFNA)	104		-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	108		-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	99		-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	122		-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	120		-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	101		-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	113		-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	132		-		59-134	-		30
Perfluorooctanesulfonamide (FOSA)	114		-		67-137	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	115		-		61-139	-		30
Perfluorododecanoic Acid (PFDoA)	110		-		69-135	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS		LCSD		%Recovery		RPD	RPD	
	%Recovery	Qual	%Recovery	Qual	Limits	Qual		Limits	
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02 Batch: WG1744878-2									
Perfluorotridecanoic Acid (PFTrDA)	115		-		66-139		-		30
Perfluorotetradecanoic Acid (PFTA)	115		-		69-133		-		30

Surrogate (Extracted Internal Standard)	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Perfluoro[13C4]Butanoic Acid (MPFBA)	92				61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	100				58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	81				74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	70				14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	78				66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	79				71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87				78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	97				75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	84				20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	86				72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	85				79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	88				75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	97				19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	95				31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	94				61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	11				5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	80				34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	99				54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	69				24-159

Lab Control Sample Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02 Batch: WG1744878-2								
Perfluorooctanesulfonamide (FOSA)	104		-		67-137	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	75				5-117

Matrix Spike Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 16-17 QC Batch ID: WG1743275-3 QC Sample: L2304561-01 Client ID: MS Sample												
Perfluorobutanoic Acid (PFBA)	3.56	39.2	44.1	104		-	-		67-148	-		30
Perfluoropentanoic Acid (PFPeA)	5.47	39.2	47.4	107		-	-		63-161	-		30
Perfluorobutanesulfonic Acid (PFBS)	ND	34.8	36.7	102		-	-		65-157	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	36.7	42.5	116		-	-		37-219	-		30
Perfluorohexanoic Acid (PFHxA)	5.06	39.2	44.9	102		-	-		69-168	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	36.9	38.0	101		-	-		52-156	-		30
Perfluoroheptanoic Acid (PFHpA)	4.76	39.2	46.4	106		-	-		58-159	-		30
Perfluorohexanesulfonic Acid (PFHxS)	3.54	35.8	41.0	105		-	-		69-177	-		30
Perfluorooctanoic Acid (PFOA)	4.16F	39.2	47.4	110		-	-		63-159	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	37.3	44.1	118		-	-		49-187	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	37.4	38.2	102		-	-		61-179	-		30
Perfluorononanoic Acid (PFNA)	ND	39.2	39.2	100		-	-		68-171	-		30
Perfluorooctanesulfonic Acid (PFOS)	ND	36.3	35.8	94		-	-		52-151	-		30
Perfluorodecanoic Acid (PFDA)	ND	39.2	41.1	105		-	-		63-171	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	37.6	47.0	125		-	-		56-173	-		30
Perfluorononanesulfonic Acid (PFNS)	ND	37.7	36.3	96		-	-		48-150	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	39.2	50.1	128		-	-		60-166	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	39.2	35.7	91		-	-		60-153	-		30
Perfluorodecanesulfonic Acid (PFDS)	ND	37.8	35.6	94		-	-		38-156	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	39.2	37.8	96		-	-		45-170	-		30
Perfluorododecanoic Acid (PFDoA)	ND	39.2	35.2	90		-	-		67-153	-		30
Perfluorotridecanoic Acid (PFTrDA)	ND	39.2	44.6	114		-	-		48-158	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 16-17 QC Batch ID: WG1743275-3 QC Sample: L2304561-01 Client ID: MS Sample												
Perfluorotetradecanoic Acid (PFTA)	ND	39.2	53.6	137		-	-		59-182	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	382	541	142		-	-		57-162	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	37	36.9	100		-	-		69-143	-		30
Perfluorohexadecanoic Acid (PFHxDA)	ND	39.2	45.6	116		-	-		40-167	-		30
Perfluorooctadecanoic Acid (PFODA)	ND	39.2	13.5	34		-	-		10-119	-		30
Perfluorododecane Sulfonic Acid (PFDoDS)	ND	37.9	37.2	98		-	-		69-141	-		30
1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)	ND	37.8	41.9	111		-	-		81-188	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	36.6	31.4	86		-	-		55-158	-		30
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	37	23.9	65		-	-		52-156	-		30

<i>Surrogate (Extracted Internal Standard)</i>	<i>MS</i>		<i>MSD</i>		<i>Acceptance Criteria</i>
	<i>% Recovery</i>	<i>Qualifier</i>	<i>% Recovery</i>	<i>Qualifier</i>	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	73				10-162
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	110				12-142
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	96				14-147
1H,1H,2H,2H-Perfluorododecane Sulfonate (M2D4-10:2FTS)	90				50-150
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	58				10-165
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	51				27-126
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	42				24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	62				55-137
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	53	Q			62-124

Matrix Spike Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 16-17 QC Batch ID: WG1743275-3 QC Sample: L2304561-01 Client ID: MS Sample												

<i>Surrogate (Extracted Internal Standard)</i>	<i>MS</i>		<i>MSD</i>		<i>Acceptance Criteria</i>
	<i>% Recovery</i>	<i>Qualifier</i>	<i>% Recovery</i>	<i>Qualifier</i>	
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	61				57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	66				60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	86				71-134
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	63				48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	59				22-136
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	74				10-206
Perfluoro[13C4]Butanoic Acid (MPFBA)	73				58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	73				62-163
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	77				69-131
Perfluoro[13C8]Octanoic Acid (M8PFOA)	70				62-129
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	67				59-139
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	77				70-131

Matrix Spike Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG1743980-3 QC Sample: L2305132-01 Client ID: S-19 (0-6")												
Perfluorobutanoic Acid (PFBA)	ND	6.58	6.60	99		-	-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	ND	6.58	6.63	101		-	-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	ND	5.84	5.82	100		-	-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	6.17	6.86	111		-	-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	ND	6.58	6.70	101		-	-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	6.2	6.98	113		-	-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	ND	6.58	6.63	101		-	-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	0.387	6.01	8.01	127		-	-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	ND	6.58	6.14	92		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	6.26	7.41	118		-	-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	6.27	7.18	114		-	-		70-132	-		30
Perfluorononanoic Acid (PFNA)	ND	6.58	7.12	108		-	-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	2.62	6.1	9.69	116		-	-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	ND	6.58	6.86	102		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	6.31	7.96	126		-	-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	ND	6.33	6.50	103		-	-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	6.58	8.59	131		-	-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	6.58	6.54	98		-	-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	ND	6.35	5.49	86		-	-		59-134	-		30
Perfluorooctanesulfonamide (FOSA)	ND	6.58	6.85F	104		-	-		67-137	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	6.58	7.28F	111		-	-		61-139	-		30
Perfluorododecanoic Acid (PFDoA)	ND	6.58	6.51	99		-	-		69-135	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG1743980-3 QC Sample: L2305132-01 Client ID: S-19 (0-6")												
Perfluorotridecanoic Acid (PFTrDA)	ND	6.58	7.73	118		-	-		66-139	-		30
Perfluorotetradecanoic Acid (PFTA)	ND	6.58	6.93	104		-	-		69-133	-		30

<i>Surrogate (Extracted Internal Standard)</i>	<i>MS % Recovery</i>	<i>Qualifier</i>	<i>MSD % Recovery</i>	<i>Qualifier</i>	<i>Acceptance Criteria</i>
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	83				19-175
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	72				14-167
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	85				20-154
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	24	Q			34-137
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	27	Q			31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUOA)	56	Q			61-155
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	57	Q			75-130
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	52	Q			66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	55	Q			71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	67	Q			78-139
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	44	Q			54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	7	Q			24-159
Perfluoro[13C4]Butanoic Acid (MPFBA)	56	Q			61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	58				58-150
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	2	Q			5-117
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	62	Q			79-136
Perfluoro[13C8]Octanoic Acid (M8PFOA)	63	Q			75-130
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	57	Q			72-140
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	69	Q			74-139

Matrix Spike Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02 QC Batch ID: WG1744878-3 QC Sample: L2305214-01 Client ID: MS Sample												
Perfluorobutanoic Acid (PFBA)	ND	6.02	6.54	107		-	-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	ND	6.02	6.42	105		-	-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	ND	5.35	5.70	107		-	-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	5.65	7.01	124		-	-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	ND	6.02	6.66	109		-	-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	5.67	7.38	130	Q	-	-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	ND	6.02	6.42	106		-	-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	0.572	5.51	6.48	107		-	-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	ND	6.02	7.35	120		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	5.74	6.98	122		-	-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	5.75	6.07	106		-	-		70-132	-		30
Perfluorononanoic Acid (PFNA)	ND	6.02	6.05	99		-	-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	6.92	5.59	11.7	86		-	-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	ND	6.02	6.10	99		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	5.78	7.53	130		-	-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	ND	5.8	6.11	105		-	-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	6.02	6.95	115		-	-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	6.02	5.72	94		-	-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	ND	5.82	6.02	103		-	-		59-134	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	6.02	5.60	93		-	-		61-139	-		30
Perfluorododecanoic Acid (PFDoA)	ND	6.02	7.16	119		-	-		69-135	-		30
Perfluorotridecanoic Acid (PFTrDA)	ND	6.02	7.98	132		-	-		66-139	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02 QC Batch ID: WG1744878-3 QC Sample: L2305214-01 Client ID: MS Sample												
Perfluorotetradecanoic Acid (PFTA)	ND	6.02	8.08F	134	Q	-	-		69-133	-		30

<i>Surrogate (Extracted Internal Standard)</i>	<i>MS</i>		<i>MSD</i>		<i>Acceptance Criteria</i>
	<i>% Recovery</i>	<i>Qualifier</i>	<i>% Recovery</i>	<i>Qualifier</i>	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	69				19-175
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	60				14-167
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	75				20-154
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	46				34-137
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	46				31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	88				61-155
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	76				75-130
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	66				66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	70	Q			71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	75	Q			78-139
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	77				54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	17	Q			24-159
Perfluoro[13C4]Butanoic Acid (MPFBA)	73				61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	81				58-150
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	72	Q			79-136
Perfluoro[13C8]Octanoic Acid (M8PFOA)	71	Q			75-130
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	75				72-140
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	70	Q			74-139

Matrix Spike Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02 QC Batch ID: WG1744878-3 QC Sample: L2305214-01 Client ID: MS Sample												
Perfluorooctanesulfonamide (FOSA)	ND	6.02	6.42	107		-	-		67-137	-		30

Surrogate (Extracted Internal Standard)	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	75				5-117

Lab Duplicate Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305132

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 16-17 QC Batch ID: WG1743275-4 QC Sample: L2304561-03 Client ID: DUP Sample						
Perfluorobutanoic Acid (PFBA)	18.4	18.4	ng/l	0		30
Perfluoropentanoic Acid (PFPeA)	21.5	21.9	ng/l	2		30
Perfluorobutanesulfonic Acid (PFBS)	6.86	7.18	ng/l	5		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/l	NC		30
Perfluorohexanoic Acid (PFHxA)	18.4	17.4	ng/l	6		30
Perfluoropentanesulfonic Acid (PFPeS)	4.05	4.26	ng/l	5		30
Perfluoroheptanoic Acid (PFHpA)	11.5	11.1	ng/l	4		30
Perfluorohexanesulfonic Acid (PFHxS)	20.0	20.6	ng/l	3		30
Perfluorooctanoic Acid (PFOA)	11.9	12.4	ng/l	4		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/l	NC		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/l	NC		30
Perfluorononanoic Acid (PFNA)	ND	ND	ng/l	NC		30
Perfluorooctanesulfonic Acid (PFOS)	27.2	25.1	ng/l	8		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/l	NC		30
Perfluorononanesulfonic Acid (PFNS)	ND	ND	ng/l	NC		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	ND	ng/l	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/l	NC		30
Perfluorodecanesulfonic Acid (PFDS)	ND	ND	ng/l	NC		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	ND	ng/l	NC		30

Lab Duplicate Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305132

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 16-17 QC Batch ID: WG1743275-4 QC Sample: L2304561-03 Client ID: DUP Sample						
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/l	NC		30
Perfluorotridecanoic Acid (PFTrDA)	ND	ND	ng/l	NC		30
Perfluorotetradecanoic Acid (PFTA)	ND	ND	ng/l	NC		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	ND	ng/l	NC		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	ND	ng/l	NC		30
Perfluorohexadecanoic Acid (PFHxDA)	ND	ND	ng/l	NC		30
Perfluorooctadecanoic Acid (PFODA)	ND	ND	ng/l	NC		30
Perfluorododecane Sulfonic Acid (PFDoDS)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)	ND	ND	ng/l	NC		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	ND	ng/l	NC		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	ND	ng/l	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	65		79		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	85		88		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	71		85		62-129
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	64		78		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	79		90		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	73		67		62-124

Lab Duplicate Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305132

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG1743980-4 QC Sample: L2305132-02 Client ID: S-20 (0-6")						
Perfluorobutanoic Acid (PFBA)	ND	ND	ng/g	NC		30
Perfluoropentanoic Acid (PFPeA)	ND	ND	ng/g	NC		30
Perfluorobutanesulfonic Acid (PFBS)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/g	NC		30
Perfluorohexanoic Acid (PFHxA)	ND	ND	ng/g	NC		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	ND	ng/g	NC		30
Perfluoroheptanoic Acid (PFHpA)	ND	ND	ng/g	NC		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	ND	ng/g	NC		30
Perfluorooctanoic Acid (PFOA)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/g	NC		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/g	NC		30
Perfluorononanoic Acid (PFNA)	ND	ND	ng/g	NC		30
Perfluorooctanesulfonic Acid (PFOS)	3.51	3.02F	ng/g	15		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/g	NC		30
Perfluorononanesulfonic Acid (PFNS)	ND	ND	ng/g	NC		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	ND	ng/g	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/g	NC		30
Perfluorodecanesulfonic Acid (PFDS)	ND	ND	ng/g	NC		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	ND	ng/g	NC		30

Lab Duplicate Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305132

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG1743980-4 QC Sample: L2305132-02 Client ID: S-20 (0-6")						
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/g	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	72		75		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	72		75		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	75		76		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	75		78		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	60	Q	63	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	63	Q	64	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	75	Q	75	Q	78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	68	Q	71	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	84		85		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	63	Q	65	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	66	Q	67	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	64	Q	64	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	86		80		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	19	Q	13	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	58	Q	62		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	13	Q	8	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	42	Q	35	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	3	Q	1	Q	24-159

Lab Duplicate Analysis
Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305132

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-15 QC Batch ID: WG1743980-4 QC Sample: L2305132-02 Client ID: S-20 (0-6")						
Perfluorooctanesulfonamide (FOSA)	ND	ND	ng/g	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	82		81		5-117



Lab Duplicate Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305132

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02 QC Batch ID: WG1744878-4 QC Sample: L2305214-02 Client ID: DUP Sample						
Perfluorobutanoic Acid (PFBA)	ND	ND	ng/g	NC		30
Perfluoropentanoic Acid (PFPeA)	ND	ND	ng/g	NC		30
Perfluorobutanesulfonic Acid (PFBS)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/g	NC		30
Perfluorohexanoic Acid (PFHxA)	ND	ND	ng/g	NC		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	ND	ng/g	NC		30
Perfluoroheptanoic Acid (PFHpA)	ND	ND	ng/g	NC		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	ND	ng/g	NC		30
Perfluorooctanoic Acid (PFOA)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/g	NC		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/g	NC		30
Perfluorononanoic Acid (PFNA)	ND	ND	ng/g	NC		30
Perfluorooctanesulfonic Acid (PFOS)	2.19	2.34	ng/g	7		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/g	NC		30
Perfluorononanesulfonic Acid (PFNS)	ND	ND	ng/g	NC		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	ND	ng/g	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/g	NC		30
Perfluorodecanesulfonic Acid (PFDS)	ND	ND	ng/g	NC		30
Perfluorooctanesulfonamide (FOSA)	ND	ND	ng/g	NC		30

Lab Duplicate Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305132

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02 QC Batch ID: WG1744878-4 QC Sample: L2305214-02 Client ID: DUP Sample						
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	ND	ng/g	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/g	NC		30
Perfluorotridecanoic Acid (PFTTrDA)	ND	ND	ng/g	NC		30
Perfluorotetradecanoic Acid (PFTA)	ND	ND	ng/g	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	71		62		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	78		69		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	75		73	Q	74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	61		59		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	66		62	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	69	Q	68	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	83		79		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	82		77		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	77		74		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	65	Q	79		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	80		73	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	69	Q	71	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	79		77		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	55		50		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	82		86		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	48		44		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	79		86		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	17	Q	8	Q	24-159

INORGANICS & MISCELLANEOUS

Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-01

Date Collected: 01/30/23 10:15

Client ID: S-19 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	68.8		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-02
Client ID: S-20 (0-6")
Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 10:45
Date Received: 01/30/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	83.0		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-03

Date Collected: 01/30/23 11:15

Client ID: S-21 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	79.7		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-04

Date Collected: 01/30/23 11:40

Client ID: S-22 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	72.8		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-05

Date Collected: 01/30/23 12:30

Client ID: S-23 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	79.0		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-06
Client ID: S-24 (0-6")
Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 13:40
Date Received: 01/30/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	85.0		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-07

Date Collected: 01/30/23 13:15

Client ID: S-25 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	69.0		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-08

Date Collected: 01/30/23 14:10

Client ID: S-26 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	81.0		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-09

Date Collected: 01/30/23 14:30

Client ID: S-27 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	77.7		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-10

Date Collected: 01/30/23 15:00

Client ID: S-28 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	66.2		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-11

Date Collected: 01/30/23 15:20

Client ID: S-29 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	63.3		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-12

Date Collected: 01/30/23 16:00

Client ID: S-30 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	82.9		%	0.100	--	1	-	02/01/23 10:23	121,2540G	VAM



Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-13
 Client ID: S-31 (0-6")
 Sample Location: 703 CHICOPEE ROW

Date Collected: 01/30/23 16:10
 Date Received: 01/30/23
 Field Prep: Not Specified

Sample Depth:
 Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	79.6		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-14

Date Collected: 01/30/23 16:30

Client ID: S-32 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	68.4		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Project Name: GROTON-DUNSTABLE

Lab Number: L2305132

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2305132-15

Date Collected: 01/30/23 17:00

Client ID: S-33 (0-6")

Date Received: 01/30/23

Sample Location: 703 CHICOPEE ROW

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	60.9		%	0.100	--	1	-	01/31/23 19:05	121,2540G	MSA



Lab Duplicate Analysis

Batch Quality Control

Project Name: GROTON-DUNSTABLE

Project Number: G-5078

Lab Number: L2305132

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01-11,13-15 QC Batch ID: WG1739323-1 QC Sample: L2305132-02 Client ID: S-20 (0-6")						
Solids, Total	83.0	85.0	%	2		10
General Chemistry - Mansfield Lab Associated sample(s): 12 QC Batch ID: WG1739626-1 QC Sample: L2305132-12 Client ID: S-30 (0-6")						
Solids, Total	82.9	84.0	%	1		10

Project Name: GROTON-DUNSTABLE**Lab Number:** L2305132**Project Number:** G-5078**Report Date:** 03/08/23**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2305132-01A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-01B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-02A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-02B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-03A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-03B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-04A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-04B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-05A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-05B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-06A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-06B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-07A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-07B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-08A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-08B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-09A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-09B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-10A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-10B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-11A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-11B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-12A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)

Project Name: GROTON-DUNSTABLE**Lab Number:** L2305132**Project Number:** G-5078**Report Date:** 03/08/23**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2305132-12B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-13A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-13B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-14A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-14B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-15A	Plastic 8oz unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(90)
L2305132-15B	Plastic 2oz unpreserved for TS	A	NA		5.6	Y	Absent		A2-TS(7)
L2305132-16A	Plastic 250ml unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(28)
L2305132-17A	Plastic 250ml unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(28)
L2305132-17B	Plastic 250ml unpreserved	A	NA		5.6	Y	Absent		A2-537-ISOTOPE(28)

PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
PERFLUOROALKYL CARBOXYLIC ACIDS (PFCAs)		
Perfluorooctadecanoic Acid	PFODA	16517-11-6
Perfluorohexadecanoic Acid	PFHxDA	67905-19-5
Perfluorotetradecanoic Acid	PFTA/PFTeDA	376-06-7
Perfluorotridecanoic Acid	PFTrDA	72629-94-8
Perfluorododecanoic Acid	PFDoA	307-55-1
Perfluoroundecanoic Acid	PFUnA	2058-94-8
Perfluorodecanoic Acid	PFDA	335-76-2
Perfluorononanoic Acid	PFNA	375-95-1
Perfluorooctanoic Acid	PFOA	335-67-1
Perfluoroheptanoic Acid	PFHpA	375-85-9
Perfluorohexanoic Acid	PFHxA	307-24-4
Perfluoropentanoic Acid	PFPeA	2706-90-3
Perfluorobutanoic Acid	PFBA	375-22-4
PERFLUOROALKYL SULFONIC ACIDS (PFSAs)		
Perfluorododecanesulfonic Acid	PFDoDS/PFDoS	79780-39-5
Perfluorodecanesulfonic Acid	PFDS	335-77-3
Perfluorononanesulfonic Acid	PFNS	68259-12-1
Perfluorooctanesulfonic Acid	PFOS	1763-23-1
Perfluoroheptanesulfonic Acid	PFHpS	375-92-8
Perfluorohexanesulfonic Acid	PFHxS	355-46-4
Perfluoropentanesulfonic Acid	PFPeS	2706-91-4
Perfluorobutanesulfonic Acid	PFBS	375-73-5
Perfluoropropanesulfonic Acid	PFPrS	423-41-6
FLUOROTELOMERS		
1H,1H,2H,2H-Perfluorododecanesulfonic Acid	10:2FTS	120226-60-0
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	8:2FTS	39108-34-4
1H,1H,2H,2H-Perfluorooctanesulfonic Acid	6:2FTS	27619-97-2
1H,1H,2H,2H-Perfluorohexanesulfonic Acid	4:2FTS	757124-72-4
PERFLUOROALKANE SULFONAMIDES (FASAs)		
Perfluorooctanesulfonamide	FOSA/PFOSA	754-91-6
N-Ethyl Perfluorooctane Sulfonamide	NEtFOSA	4151-50-2
N-Methyl Perfluorooctane Sulfonamide	NMeFOSA	31506-32-8
PERFLUOROALKANE SULFONYL SUBSTANCES		
N-Ethyl Perfluorooctanesulfonamido Ethanol	NEtFOSE	1691-99-2
N-Methyl Perfluorooctanesulfonamido Ethanol	NMeFOSE	24448-09-7
N-Ethyl Perfluorooctanesulfonamidoacetic Acid	NEtFOSAA	2991-50-6
N-Methyl Perfluorooctanesulfonamidoacetic Acid	NMeFOSAA	2355-31-9
PER- and POLYFLUOROALKYL ETHER CARBOXYLIC ACIDS		
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid	HFPO-DA	13252-13-6
4,8-Dioxa-3h-Perfluorononanoic Acid	ADONA	919005-14-4
CHLORO-PERFLUOROALKYL SULFONIC ACIDS		
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid	11Cl-PF3OUdS	763051-92-9
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	9Cl-PF3ONS	756426-58-1
PERFLUOROETHER SULFONIC ACIDS (PFESAs)		
Perfluoro(2-Ethoxyethane)Sulfonic Acid	PFEEESA	113507-82-7
PERFLUOROETHER/POLYETHER CARBOXYLIC ACIDS (PFPCAs)		
Perfluoro-3-Methoxypropanoic Acid	PFMPA	377-73-1
Perfluoro-4-Methoxybutanoic Acid	PFMBA	863090-89-5
Nonafluoro-3,6-Dioxaheptanoic Acid	NFDHA	151772-58-6

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Serial_No:03082315:28
Lab Number: L2305132
Report Date: 03/08/23

PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
FLUOROTELOMER CARBOXYLIC ACIDS (FTCAs)		
3-Perfluoroheptyl Propanoic Acid	7:3FTCA	812-70-4
2H,2H,3H,3H-Perfluorooctanoic Acid	5:3FTCA	914637-49-3
3-Perfluoropropyl Propanoic Acid	3:3FTCA	356-02-5

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report



Project Name: GROTON-DUNSTABLE**Lab Number:** L2305132**Project Number:** G-5078**Report Date:** 03/08/23**Data Qualifiers**

- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name: GROTON-DUNSTABLE
Project Number: G-5078

Lab Number: L2305132
Report Date: 03/08/23

REFERENCES

- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

PAGE 1 OF 2

WESTBORO, MA
TEL: 508-898-9220
FAX: 508-898-9193

MANSFIELD, MA
TEL: 508-822-9300
FAX: 508-822-3288

Client Information

Client: Tigre & Bond

Address: 53 Southampton Rd
Westfield, MA 01085

Phone: 413-562-1600

Fax: -

Email: MG.Wagner@tignetbond.com

These samples have been previously analyzed by Alpha

Project Information

Project Name: Groton-Dunstable

Project Location: 703 Chicopee Row

Project #: G-5078

Project Manager: Matt Wagner

ALPHA Quote #:

Turn-Around Time

Standard RUSH (only confirmed if pre-approved!)

Date Due: 2/20/23 Time:

Date Rec'd in Lab: 1/30/23 **T+B**

ALPHA Job #: La 305132

Report Information - Data Deliverables

FAX EMAIL

ADEX Add'l Deliverables

Billing Information

Same as Client info PO #: G-5078

Regulatory Requirements/Report Limits

State / Fed Program MCP Criteria S-1/GW-1/RCS-1

Other Project Specific Requirements/Comments/Detection Limits:

S-1/GW-1

ANALYSIS

PFAS by Isotope Dilution

SAMPLE HANDLING

Filtration _____

Done

Not needed

Lab to do

Preservation

Lab to do

(Please specify below)

Sample Specific Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials	
		Date	Time			
<u>B32-01</u>	<u>S-19(0-6")</u>	<u>1/30/23</u>	<u>1015</u>	<u>S</u>	<u>NG</u>	<input checked="" type="checkbox"/>
<u>-02</u>	<u>S-20(0-6")</u>		<u>1045</u>			<input checked="" type="checkbox"/>
<u>-03</u>	<u>S-21(0-6")</u>		<u>1115</u>			<input checked="" type="checkbox"/>
<u>-04</u>	<u>S-22(0-6")</u>		<u>1140</u>			<input checked="" type="checkbox"/>
<u>-05</u>	<u>S-23(0-6")</u>		<u>1230</u>			<input checked="" type="checkbox"/>
<u>-06</u>	<u>S-24(0-6")</u>		<u>1340</u>			<input checked="" type="checkbox"/>
<u>-07</u>	<u>S-25(0-6")</u>		<u>1315</u>			<input checked="" type="checkbox"/>
<u>-08</u>	<u>S-26(0-6")</u>		<u>1410</u>			<input checked="" type="checkbox"/>
<u>-09</u>	<u>S-27(0-6")</u>		<u>1430</u>			<input checked="" type="checkbox"/>
<u>-10</u>	<u>S-28(0-6")</u>	<u>↓</u>	<u>1500</u>	<u>↓</u>	<u>↓</u>	<input checked="" type="checkbox"/>

Container Type P

Preservative I

Relinquished By:	Date/Time	Received By:	Date/Time
<u>Rob M...</u>	<u>1/30/23 1730</u>	<u>Rob M...</u>	<u>1-30-23 1730</u>
<u>Rob M...</u>	<u>1/30/23 1830</u>	<u>...</u>	<u>1/30/23 1830</u>
<u>R. M...</u>	<u>1/30/23 2100</u>	<u>R. M...</u>	<u>1/30/23 1900</u>

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.



CHAIN OF CUSTODY

WESTBORO, MA MANSFIELD, MA
 TEL: 508-898-9220 TEL: 508-822-9300
 FAX: 508-898-9193 FAX: 508-822-3288

Client Information

Client: *see p.1*
 Address: *see p.1*
 Phone:
 Fax:
 Email:
 These samples have been previously analyzed by Alpha

Project Information

Project Name:
 Project Location: *see p.1*
 Project #:
 Project Manager:
 ALPHA Quote #:

Turn-Around Time

Standard RUSH (only confirmed if pre-approved!)
 Date Due: *2/20/23* Time:

Date Rec'd in Lab: *1/30/23*

Report Information - Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

ALPHA Job #: *L230532*

Billing Information

Same as Client info PO #: *G-5078*

Regulatory Requirements/Report Limits

State /Fed Program: *MCP* Criteria: *S-1/GW-1 / RCS-1*

Other Project Specific Requirements/Comments/Detection Limits:

TOTAL # BOTTLES

ANALYSIS

PFAS by Isotope Dilution

SAMPLE HANDLING

Filtration _____

Done

Not needed

Lab to do

Preservation _____

Lab to do

(Please specify below)

Sample Specific Comments

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials	
		Date	Time			
<i>-11</i>	<i>S-29 (0-6")</i>	<i>1/30/23</i>	<i>1520</i>	<i>S</i>	<i>NG</i>	<input checked="" type="checkbox"/>
<i>-12</i>	<i>S-30 (6-6")</i>	<i>1/30/23</i>	<i>1600</i>			<input checked="" type="checkbox"/>
<i>-13</i>	<i>S-31 (0-6")</i>	<i>1/30/23</i>	<i>1610</i>			<input checked="" type="checkbox"/>
<i>-14</i>	<i>S-32 (0-6")</i>	<i>1/30/23</i>	<i>1630</i>			<input checked="" type="checkbox"/>
<i>-15</i>	<i>S-33 (0-6")</i>	<i>1/30/23</i>	<i>1700</i>			<input checked="" type="checkbox"/>
<i>-16</i>	<i>Field Blank</i>	<i>1/30/23</i>	<i>1703</i>			<input checked="" type="checkbox"/>
<i>-17</i>	<i>Equipment Blank</i>	<i>1/30/23</i>	<i>1705</i>	<i>↓</i>	<i>↓</i>	<input checked="" type="checkbox"/>

Container Type: *P*
 Preservative: *I*

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Relinquished By: <i>[Signature]</i>	Date/Time: <i>1/30/23 1730</i>	Received By: <i>[Signature]</i>	Date/Time: <i>1-30-23 1730</i>
<i>[Signature]</i>	<i>1-30-23 1830</i>	<i>[Signature]</i>	<i>1/30/23 1830</i>
<i>[Signature]</i>	<i>1/30/23 1930</i>	<i>[Signature]</i>	<i>1/30/23 1950</i>
<i>[Signature]</i>	<i>1/30/23 2100</i>	<i>[Signature]</i>	<i>1/30/23 2100</i>



ANALYTICAL REPORT

Lab Number:	L2254870
Client:	Tighe & Bond, Inc. 53 Southampton Road Westfield, MA 01085
ATTN:	Nick Guidi
Phone:	(508) 244-8466
Project Name:	DUNSTABLE-GROTON
Project Number:	G-5078
Report Date:	03/08/23

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2254870-01	S-11	SOIL	GROTON, MA	10/04/22 13:45	10/04/22
L2254870-02	FIELD BLANK	WATER	GROTON, MA	10/04/22 13:55	10/04/22
L2254870-03	S-12	SOIL	GROTON, MA	10/04/22 14:00	10/04/22
L2254870-04	S-13	SOIL	GROTON, MA	10/04/22 14:15	10/04/22
L2254870-05	S-14	SOIL	GROTON, MA	10/04/22 14:35	10/04/22
L2254870-06	S-15	SOIL	GROTON, MA	10/04/22 15:15	10/04/22
L2254870-07	S-16	SOIL	GROTON, MA	10/04/22 15:25	10/04/22
L2254870-08	S-17	SOIL	GROTON, MA	10/04/22 15:35	10/04/22
L2254870-09	S-18	SOIL	GROTON, MA	10/04/22 15:45	10/04/22
L2254870-10	EQUIPMENT BLANK	WATER	GROTON, MA	10/04/22 16:00	10/04/22
L2254870-11	S-1	SOIL	GROTON, MA	10/04/22 11:40	10/04/22
L2254870-12	S-2	SOIL	GROTON, MA	10/04/22 11:30	10/04/22
L2254870-13	S-3	SOIL	GROTON, MA	10/04/22 11:50	10/04/22
L2254870-14	S-4	SOIL	GROTON, MA	10/04/22 12:00	10/04/22
L2254870-15	S-5	SOIL	GROTON, MA	10/04/22 12:15	10/04/22
L2254870-16	S-6	SOIL	GROTON, MA	10/04/22 12:30	10/04/22
L2254870-17	S-7	SOIL	GROTON, MA	10/04/22 12:40	10/04/22
L2254870-18	S-8	SOIL	GROTON, MA	10/04/22 12:50	10/04/22
L2254870-19	S-9	SOIL	GROTON, MA	10/04/22 13:05	10/04/22
L2254870-20	S-10	SOIL	GROTON, MA	10/04/22 13:30	10/04/22

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Case Narrative (continued)

Report Revision

March 08, 2023: All non-detect (ND) concentrations have been quantitated to the limit noted in the RL column.

Perfluorinated Alkyl Acids by Isotope Dilution

L2254870-01, -03 through -09, -11 through -20, WG1700387-3 and WG1700387-4: The MeOH fraction of the extraction is reported for perfluorooctanesulfonamide (fosa) due to better extraction efficiency of the perfluoro[13c8]octanesulfonamide (m8fosa) Extracted Internal Standard.

L2254870-03, -05, -06, -07, -12, -13, -14, -16, -17, -18, -19, -20, WG1700387-1, WG1700387-2, and WG1700387-4: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for detail

L2254870-13: The Extracted Internal Standard recoveries are less than 5% for perfluoro[1,2-13c2]tetradecanoic acid (m2pfteda) (3%); however, the extraction efficiency was improved upon re-extraction at a lower volume with the method required holding time exceeded. The results of both extractions are reported for the associated target compounds.

WG1700387-1: The Extracted Internal Standard recovery for the WG1700387-1 Method Blank, associated with L2254870-01, -03 through -09 and -11 through -20, is below the acceptance criteria for perfluoro[13c8]octanesulfonamide (m8fosa) (less than 5%); however, the associated samples are non-detect to the RL for all associated target analytes; therefore, no further action was taken.

WG1700387-2: The Extracted Internal Standard recovery for the WG1700387-2 LCS, associated with L2254870-01, -03 through -09 and -11 through -20, is below the acceptance criteria (less than 5%) for perfluoro[13c8]octanesulfonamide (m8fosa) (1%); however, all associated target analytes are within overall LCS criteria; therefore, no further action was taken.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

Michael Chang Michael Chang

Title: Technical Director/Representative

Date: 03/08/23

ORGANICS

SEMIVOLATILES

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-01
Client ID: S-11
Sample Location: GROTON, MA

Date Collected: 10/04/22 13:45
Date Received: 10/04/22
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/07/22 14:24
Analyst: JW
Percent Solids: 86%

Extraction Method: ALPHA 23528
Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.556	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.556	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.278	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.11	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.556	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.11	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.278	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.278	--	1
Perfluorooctanoic Acid (PFOA)	0.297		ng/g	0.278	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.556	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.556	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.278	--	1
Perfluorooctanesulfonic Acid (PFOS)	6.24		ng/g	0.278	--	1
Perfluorodecanoic Acid (PFDA)	0.624		ng/g	0.278	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.556	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.11	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.556	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.556	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.556	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.556	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.556	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.556	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.556	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-01
 Client ID: S-11
 Sample Location: GROTON, MA

Date Collected: 10/04/22 13:45
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	83		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	83		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	69		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	82		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	81		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	94		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	92		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	82		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	87		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	91		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	85		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	96		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	50		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	84		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	48		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	78		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	51		24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-01
 Client ID: S-11
 Sample Location: GROTON, MA

Date Collected: 10/04/22 13:45
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 18:57
 Analyst: JW
 Percent Solids: 86%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.556	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			79		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-02
 Client ID: FIELD BLANK
 Sample Location: GROTON, MA

Date Collected: 10/04/22 13:55
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/09/22 23:50
 Analyst: AC

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 10:23

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.76	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.76	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.76	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.76	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.76	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.76	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.76	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.76	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.76	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.76	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.76	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.76	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.76	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.76	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.76	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/l	1.76	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.76	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.76	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.76	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.76	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.76	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.76	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.76	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.76	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-02
 Client ID: FIELD BLANK
 Sample Location: GROTON, MA

Date Collected: 10/04/22 13:55
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	101		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	107		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	109		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	96		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	94		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	96		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	110		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	107		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	102		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	98		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	106		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	101		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	114		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	62		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	93		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	50		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	61		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	86		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	88		22-136

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-03
 Client ID: S-12
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 14:57
 Analyst: JW
 Percent Solids: 65%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.697	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.697	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.348	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.39	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.697	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.39	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.348	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.348	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.348	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.697	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.697	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.348	--	1
Perfluorooctanesulfonic Acid (PFOS)	5.80		ng/g	0.348	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.348	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.697	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.39	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.697	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.697	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.697	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.697	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.697	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.697	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.697	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-03
 Client ID: S-12
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	74		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	76		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	91		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	69		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	74		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	76		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	92		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	85		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	80		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	82		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	85		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	79		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	85		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	40		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	81		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	28	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	63		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	10	Q	24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-03
 Client ID: S-12
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 19:09
 Analyst: JW
 Percent Solids: 65%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab

Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.697	--	1
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Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	75		5-117

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-04
 Client ID: S-13
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 15:30
 Analyst: JW
 Percent Solids: 84%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.544	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.544	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.272	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.09	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.544	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.09	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.272	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.272	--	1
Perfluorooctanoic Acid (PFOA)	0.285		ng/g	0.272	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.544	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.544	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.272	--	1
Perfluorooctanesulfonic Acid (PFOS)	11.0		ng/g	0.272	--	1
Perfluorodecanoic Acid (PFDA)	0.380		ng/g	0.272	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.544	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.09	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.544	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.544	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.544	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.544	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.544	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.544	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.544	--	1

Project Name: DUNSTABLE-GROTON**Lab Number:** L2254870**Project Number:** G-5078**Report Date:** 03/08/23**SAMPLE RESULTS**

Lab ID: L2254870-04

Date Collected: 10/04/22 14:15

Client ID: S-13

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	77		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	76		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	72		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	80		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	79		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	97		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	94		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	84		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	90		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	97		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	88		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	93		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	45		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	87		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	42		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	75		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	43		24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-04
 Client ID: S-13
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 19:21
 Analyst: JW
 Percent Solids: 84%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.544	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			76		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-05
Client ID: S-14
Sample Location: GROTON, MA

Date Collected: 10/04/22 14:35
Date Received: 10/04/22
Field Prep: Not Specified

Sample Depth:

Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/07/22 15:47
Analyst: JW
Percent Solids: 66%

Extraction Method: ALPHA 23528
Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.706	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.706	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.353	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.41	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.706	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.41	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.353	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.353	--	1
Perfluorooctanoic Acid (PFOA)	0.431		ng/g	0.353	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.706	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.706	--	1
Perfluorononanoic Acid (PFNA)	0.368		ng/g	0.353	--	1
Perfluorooctanesulfonic Acid (PFOS)	4.12		ng/g	0.353	--	1
Perfluorodecanoic Acid (PFDA)	0.682		ng/g	0.353	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.706	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.41	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.706	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.706	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.706	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.706	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.706	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.706	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.706	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-05
 Client ID: S-14
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	75		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	76		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	88		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	77		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	77		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	99		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	89		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	93		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	87		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	91		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	84		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	107		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	37		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	81		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	28	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	67		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	13	Q	24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-05
 Client ID: S-14
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 19:27
 Analyst: JW
 Percent Solids: 66%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.706	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			71		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-06
 Client ID: S-15
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 16:03
 Analyst: JW
 Percent Solids: 63%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.735	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.735	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.367	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.47	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.735	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.47	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.367	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.367	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.367	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.735	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.735	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.367	--	1
Perfluorooctanesulfonic Acid (PFOS)	5.14		ng/g	0.367	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.367	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.735	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.47	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.735	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.735	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.735	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.735	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.735	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.735	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.735	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-06
 Client ID: S-15
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	59	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	62		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	86		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	73		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	63	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	65	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	85		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	76		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	79		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	74		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	81		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	70	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	92		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	31		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	68		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	21	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	50	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	13	Q	24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-06
 Client ID: S-15
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 19:34
 Analyst: JW
 Percent Solids: 63%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab

Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.735	--	1
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Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	74		5-117

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-07
 Client ID: S-16
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:25
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 16:20
 Analyst: JW
 Percent Solids: 82%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.545	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.545	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.272	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.09	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.545	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.09	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.272	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.272	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.272	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.545	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.545	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.272	--	1
Perfluorooctanesulfonic Acid (PFOS)	4.08		ng/g	0.272	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.272	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.545	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.09	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.545	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.545	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.545	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.545	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.545	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.545	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.545	--	1

Project Name: DUNSTABLE-GROTON**Lab Number:** L2254870**Project Number:** G-5078**Report Date:** 03/08/23**SAMPLE RESULTS**

Lab ID: L2254870-07

Date Collected: 10/04/22 15:25

Client ID: S-16

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	55	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	61		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	90		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	80		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	63	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	66	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	92		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	79		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	88		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	78		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	88		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	77		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	104		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	37		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	72		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	35		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	65		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	33		24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-07
 Client ID: S-16
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:25
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 19:40
 Analyst: JW
 Percent Solids: 82%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.545	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			74		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-08
 Client ID: S-17
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 16:36
 Analyst: JW
 Percent Solids: 82%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.593	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.593	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.296	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.18	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.593	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.18	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.296	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.296	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.296	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.593	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.593	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.296	--	1
Perfluorooctanesulfonic Acid (PFOS)	7.05		ng/g	0.296	--	1
Perfluorodecanoic Acid (PFDA)	0.318		ng/g	0.296	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.593	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.18	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.593	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.593	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.593	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.593	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.593	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.593	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.593	--	1

Project Name: DUNSTABLE-GROTON**Lab Number:** L2254870**Project Number:** G-5078**Report Date:** 03/08/23**SAMPLE RESULTS**

Lab ID: L2254870-08

Date Collected: 10/04/22 15:35

Client ID: S-17

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	82		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	81		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	87		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	76		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	77		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	96		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	89		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	94		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	86		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	93		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	84		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	106		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	45		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	81		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	44		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	72		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	45		24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-08
 Client ID: S-17
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 19:46
 Analyst: JW
 Percent Solids: 82%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.593	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			76		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-09
 Client ID: S-18
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:45
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 16:53
 Analyst: JW
 Percent Solids: 83%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.548	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.548	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.274	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.10	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.548	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.10	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.274	--	1
Perfluorohexanesulfonic Acid (PFHxS)	0.320		ng/g	0.274	--	1
Perfluorooctanoic Acid (PFOA)	0.294		ng/g	0.274	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.548	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.548	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.274	--	1
Perfluorooctanesulfonic Acid (PFOS)	5.33		ng/g	0.274	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.274	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.548	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.10	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.548	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.548	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.548	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.548	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.548	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.548	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.548	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-09
 Client ID: S-18
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:45
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	69		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	72		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	79		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	73		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	75		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	97		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	88		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	90		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	85		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	93		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	86		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	109		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	43		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	79		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	39		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	65		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	34		24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-09
 Client ID: S-18
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:45
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 19:52
 Analyst: JW
 Percent Solids: 83%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab

Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.548	--	1
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Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	76		5-117

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-10
 Client ID: EQUIPMENT BLANK
 Sample Location: GROTON, MA

Date Collected: 10/04/22 16:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Water
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 11:16
 Analyst: AC

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 10:23

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.96	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.96	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.96	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.96	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.96	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.96	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.96	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.96	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.96	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.96	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.96	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.96	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.96	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.96	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.96	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/l	1.96	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.96	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.96	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.96	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.96	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.96	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.96	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.96	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.96	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-10
 Client ID: EQUIPMENT BLANK
 Sample Location: GROTON, MA

Date Collected: 10/04/22 16:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	100		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	105		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	106		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	98		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	97		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	96		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	105		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	106		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	95		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	105		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	107		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	100		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	109		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	72		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	115		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	27		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	73		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	104		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	106		22-136

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-11
 Client ID: S-1
 Sample Location: GROTON, MA

Date Collected: 10/04/22 11:40
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 17:09
 Analyst: JW
 Percent Solids: 83%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.570	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.570	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.285	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.14	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.570	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.14	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.285	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.285	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.285	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.570	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.570	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.285	--	1
Perfluorooctanesulfonic Acid (PFOS)	6.67		ng/g	0.285	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.285	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.570	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.14	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.570	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.570	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.570	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.570	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.570	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.570	--	1
Perfluorotetradecanoic Acid (PFTTA)	ND		ng/g	0.570	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-11
 Client ID: S-1
 Sample Location: GROTON, MA

Date Collected: 10/04/22 11:40
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	79		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	78		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	95		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	82		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	76		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	78		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	98		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	90		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	93		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	85		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	95		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	88		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	115		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	44		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	86		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	47		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	72		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	49		24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-11
 Client ID: S-1
 Sample Location: GROTON, MA

Date Collected: 10/04/22 11:40
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 19:58
 Analyst: JW
 Percent Solids: 83%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.570	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			74		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-12
 Client ID: S-2
 Sample Location: GROTON, MA

Date Collected: 10/04/22 11:30
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 17:26
 Analyst: JW
 Percent Solids: 65%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.710	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.710	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.355	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.42	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.710	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.42	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.355	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.355	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.355	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.710	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.710	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.355	--	1
Perfluorooctanesulfonic Acid (PFOS)	4.24		ng/g	0.355	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.355	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.710	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.42	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.710	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.710	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.710	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.710	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.710	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.710	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.710	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-12
 Client ID: S-2
 Sample Location: GROTON, MA

Date Collected: 10/04/22 11:30
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	49	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	50	Q	58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	75		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	51	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	54	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	88		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	64	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	85		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	63	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	83		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	62	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	92		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	20	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	63		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	14	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	44	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	10	Q	24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-12
 Client ID: S-2
 Sample Location: GROTON, MA

Date Collected: 10/04/22 11:30
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 20:05
 Analyst: JW
 Percent Solids: 65%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.710	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			70		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-13
 Client ID: S-3
 Sample Location: GROTON, MA

Date Collected: 10/04/22 11:50
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 17:59
 Analyst: JW
 Percent Solids: 55%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.806	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.806	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.403	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.61	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.806	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.61	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.403	--	1
Perfluorohexanesulfonic Acid (PFHxS)	0.471		ng/g	0.403	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.403	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.806	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.806	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.403	--	1
Perfluorooctanesulfonic Acid (PFOS)	6.20		ng/g	0.403	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.403	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.806	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.61	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.806	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.806	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.806	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.806	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.806	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.806	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.806	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-13
 Client ID: S-3
 Sample Location: GROTON, MA

Date Collected: 10/04/22 11:50
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	39	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	42	Q	58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	83		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	74		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	46	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	50	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	85		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	60	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	80		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	60	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	78	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	59	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	82		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	18	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	56	Q	61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	10	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	39	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	3	Q	24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-13
 Client ID: S-3
 Sample Location: GROTON, MA

Date Collected: 10/04/22 11:50
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 20:17
 Analyst: JW
 Percent Solids: 55%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.806	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			66		5-117	

Project Name: DUNSTABLE-GROTON**Lab Number:** L2254870**Project Number:** G-5078**Report Date:** 03/08/23**SAMPLE RESULTS**

Lab ID: L2254870-13 RE

Date Collected: 10/04/22 11:50

Client ID: S-3

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Extraction Method: ALPHA 23528

Analytical Method: 134,LCMSMS-ID

Extraction Date: 11/10/22 09:30

Analytical Date: 11/11/22 20:47

Analyst: RS

Percent Solids: 55%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	2.51	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	2.51	--	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	86		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	47		24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-14
 Client ID: S-4
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 18:16
 Analyst: JW
 Percent Solids: 84%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.554	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.554	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.277	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.11	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.554	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.11	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.277	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.277	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.277	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.554	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.554	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.277	--	1
Perfluorooctanesulfonic Acid (PFOS)	5.76		ng/g	0.277	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.277	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.554	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.11	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.554	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.554	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.554	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.554	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.554	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.554	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.554	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-14
 Client ID: S-4
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	60	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	62		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	90		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	83		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	62	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	64	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	93		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	79		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	88		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	76		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	86		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	77		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	99		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	37		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	77		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	37		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	63		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	37		24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-14
 Client ID: S-4
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 20:23
 Analyst: JW
 Percent Solids: 84%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
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Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab

Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.554	--	1
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Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
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Perfluoro[13C8]Octanesulfonamide (M8FOSA)	78		5-117
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Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-15
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 18:32
 Analyst: JW
 Percent Solids: 83%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.551	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.551	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.275	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.10	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.551	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.10	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.275	--	1
Perfluorohexanesulfonic Acid (PFHxS)	0.539		ng/g	0.275	--	1
Perfluorooctanoic Acid (PFOA)	0.716		ng/g	0.275	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.551	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.551	--	1
Perfluorononanoic Acid (PFNA)	0.374		ng/g	0.275	--	1
Perfluorooctanesulfonic Acid (PFOS)	5.43		ng/g	0.275	--	1
Perfluorodecanoic Acid (PFDA)	0.531		ng/g	0.275	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.551	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.10	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.551	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.551	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.551	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.551	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.551	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.551	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.551	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-15
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	78		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	77		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	95		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	86		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	74		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	75		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	95		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	88		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	91		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	84		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	94		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	85		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	112		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	45		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	82		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	42		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	69		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	53		24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-15
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 20:29
 Analyst: JW
 Percent Solids: 83%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.551	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			78		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-16
 Client ID: S-6
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:30
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 18:49
 Analyst: JW
 Percent Solids: 76%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.597	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.597	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.298	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.19	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.597	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.19	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.298	--	1
Perfluorohexanesulfonic Acid (PFHxS)	0.357		ng/g	0.298	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.298	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.597	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.597	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.298	--	1
Perfluorooctanesulfonic Acid (PFOS)	7.10		ng/g	0.298	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.298	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.597	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.19	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.597	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.597	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.597	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.597	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.597	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.597	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.597	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-16
 Client ID: S-6
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:30
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier		Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)			68			61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)			71			58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)			94			74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)			87			14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)			70			66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)			73			71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)			95			78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)			86			75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)			91			20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)			82			72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)			92			79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)			85			75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)			110			19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)			45			31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)			85			61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)			37			34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)			65			54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)			17	Q		24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-16
 Client ID: S-6
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:30
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 20:36
 Analyst: JW
 Percent Solids: 76%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.597	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			75		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-17
 Client ID: S-7
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:40
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 19:05
 Analyst: JW
 Percent Solids: 66%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.675	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.675	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.338	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.35	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.675	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.35	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.338	--	1
Perfluorohexanesulfonic Acid (PFHxS)	0.375		ng/g	0.338	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.338	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.675	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.675	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.338	--	1
Perfluorooctanesulfonic Acid (PFOS)	5.44		ng/g	0.338	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.338	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.675	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.35	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.675	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.675	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.675	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.675	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.675	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.675	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.675	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-17
 Client ID: S-7
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:40
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	61		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	63		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	89		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	83		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	64	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	67	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	90		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	78		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	86		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	73		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	84		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	71	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	104		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	33		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	69		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	27	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	53	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	23	Q	24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-17
 Client ID: S-7
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:40
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 20:42
 Analyst: JW
 Percent Solids: 66%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.675	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			70		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-18
 Client ID: S-8
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:50
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 19:22
 Analyst: JW
 Percent Solids: 62%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.735	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.735	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.367	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.47	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.735	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.47	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.367	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.367	--	1
Perfluorooctanoic Acid (PFOA)	0.430		ng/g	0.367	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.735	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.735	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.367	--	1
Perfluorooctanesulfonic Acid (PFOS)	5.57		ng/g	0.367	--	1
Perfluorodecanoic Acid (PFDA)	0.555		ng/g	0.367	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.735	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.47	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.735	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.735	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.735	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.735	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.735	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.735	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.735	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-18
 Client ID: S-8
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:50
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	79		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	79		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	93		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	82		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	77		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	79		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	94		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	89		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	87		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	82		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	88		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	83		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	100		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	35		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	80		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	21	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	59		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	12	Q	24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-18
 Client ID: S-8
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:50
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 20:48
 Analyst: JW
 Percent Solids: 62%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.735	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			70		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-19
 Client ID: S-9
 Sample Location: GROTON, MA

Date Collected: 10/04/22 13:05
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 19:38
 Analyst: JW
 Percent Solids: 65%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.725	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.725	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.362	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.45	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.725	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.45	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.362	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.362	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.362	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.725	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.725	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.362	--	1
Perfluorooctanesulfonic Acid (PFOS)	4.06		ng/g	0.362	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.362	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.725	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.45	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.725	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.725	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.725	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.725	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.725	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.725	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.725	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-19
 Client ID: S-9
 Sample Location: GROTON, MA

Date Collected: 10/04/22 13:05
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	53	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	55	Q	58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	77		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	69		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	55	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	57	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	79		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	67	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	70		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	63	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	70	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	62	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	75		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	21	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	57	Q	61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	15	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	37	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	6	Q	24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-19
 Client ID: S-9
 Sample Location: GROTON, MA

Date Collected: 10/04/22 13:05
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 20:54
 Analyst: JW
 Percent Solids: 65%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.725	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			69		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-20
 Client ID: S-10
 Sample Location: GROTON, MA

Date Collected: 10/04/22 13:30
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/07/22 19:55
 Analyst: JW
 Percent Solids: 65%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.737	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.737	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.369	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.47	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.737	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.47	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.369	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.369	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.369	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.737	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.737	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.369	--	1
Perfluorooctanesulfonic Acid (PFOS)	4.07		ng/g	0.369	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.369	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.737	--	1
Perfluoronanesulfonic Acid (PFNS)	ND		ng/g	1.47	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.737	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.737	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.737	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.737	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.737	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.737	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.737	--	1

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-20
 Client ID: S-10
 Sample Location: GROTON, MA

Date Collected: 10/04/22 13:30
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	48	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	50	Q	58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	89		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	79		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	50	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	55	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	89		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	66	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	79		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	64	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	82		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	66	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	94		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	18	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	58	Q	61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	12	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	43	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	11	Q	24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-20
 Client ID: S-10
 Sample Location: GROTON, MA

Date Collected: 10/04/22 13:30
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 134,LCMSMS-ID
 Analytical Date: 11/08/22 21:00
 Analyst: JW
 Percent Solids: 65%

Extraction Method: ALPHA 23528
 Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.737	--	1
Surrogate (Extracted Internal Standard)			% Recovery	Qualifier	Acceptance Criteria	
Perfluoro[13C8]Octanesulfonamide (M8FOSA)			67		5-117	

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/03/22 21:02
Analyst: AC

Extraction Method: ALPHA 23528
Extraction Date: 10/17/22 10:23

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 02,10 Batch: WG1700293-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	--
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	--
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	--
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	--
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	--
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	--
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	--
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	--
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	--
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	--
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	--
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	--
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	2.00	--
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	--
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	--
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	--
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	--
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	--
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	--
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.00	--
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	--

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/03/22 21:02
Analyst: AC

Extraction Method: ALPHA 23528
Extraction Date: 10/17/22 10:23

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 02,10 Batch: WG1700293-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	99		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	106		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	111		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	83		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	100		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	98		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	112		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	103		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	80		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	94		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	100		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	100		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	74		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	68		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	97		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	52		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	69		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	92		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	95		22-136

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/07/22 13:50
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01,03-09,11-20 Batch: WG1700387-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.500	--
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.500	--
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.00	--
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.500	--
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.00	--
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.250	--
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.250	--
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.500	--
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.500	--
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.250	--
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/g	0.250	--
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.500	--
Perfluorononanesulfonic Acid (PFNS)	ND		ng/g	1.00	--
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.500	--
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.500	--
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.500	--
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	--
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.500	--
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.500	--
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.500	--
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.500	--

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/07/22 13:50
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01,03-09,11-20 Batch: WG1700387-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	44	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	50	Q	58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	63	Q	74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	58		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	53	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	54	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	63	Q	78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	60	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	66		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	59	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	59	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	53	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	59		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	31		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	51	Q	61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	1	Q	5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	32	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	44	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	21	Q	24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/08/22 18:44
Analyst: JW

Extraction Method: ALPHA 23528
Extraction Date: 10/17/22 14:45

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01,03-09,11-20 Batch: WG1700387-1					
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	--

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	91		5-117

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Method Blank Analysis Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/11/22 20:14
Analyst: RS

Extraction Method: ALPHA 23528
Extraction Date: 11/10/22 09:30

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 13 Batch: WG1710149-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.500	--
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.500	--
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.00	--
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.500	--
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.00	--
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.250	--
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.250	--
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.500	--
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.500	--
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.250	--
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/g	0.250	--
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.250	--
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.500	--
Perfluorononanesulfonic Acid (PFNS)	ND		ng/g	1.00	--
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.500	--
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.500	--
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.500	--
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	--
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.500	--
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.500	--
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.500	--
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.500	--

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/11/22 20:14
Analyst: RS

Extraction Method: ALPHA 23528
Extraction Date: 11/10/22 09:30

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 13 Batch: WG1710149-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	69		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	74		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	98		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	66		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	76		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	81		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	105		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	94		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	99		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	83		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	100		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	87		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	129		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	84		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	92		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	16		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	53		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	90		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	95		24-159

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/13/22 21:29
Analyst: JPW

Extraction Method: ALPHA 23528
Extraction Date: 11/10/22 09:30

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 13 Batch: WG1710149-1					
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	--

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	76		5-117

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02,10 Batch: WG1700293-2								
Perfluorobutanoic Acid (PFBA)	101		-		67-148	-		30
Perfluoropentanoic Acid (PFPeA)	103		-		63-161	-		30
Perfluorobutanesulfonic Acid (PFBS)	101		-		65-157	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	110		-		37-219	-		30
Perfluorohexanoic Acid (PFHxA)	97		-		69-168	-		30
Perfluoropentanesulfonic Acid (PFPeS)	103		-		52-156	-		30
Perfluoroheptanoic Acid (PFHpA)	100		-		58-159	-		30
Perfluorohexanesulfonic Acid (PFHxS)	110		-		69-177	-		30
Perfluorooctanoic Acid (PFOA)	96		-		63-159	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	109		-		49-187	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	107		-		61-179	-		30
Perfluorononanoic Acid (PFNA)	101		-		68-171	-		30
Perfluorooctanesulfonic Acid (PFOS)	109		-		52-151	-		30
Perfluorodecanoic Acid (PFDA)	104		-		63-171	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	113		-		56-173	-		30
Perfluorononanesulfonic Acid (PFNS)	101		-		48-150	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	93		-		60-166	-		30
Perfluoroundecanoic Acid (PFUnA)	106		-		60-153	-		30
Perfluorodecanesulfonic Acid (PFDS)	100		-		38-156	-		30
Perfluorooctanesulfonamide (FOSA)	107		-		46-170	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	104		-		45-170	-		30
Perfluorododecanoic Acid (PFDoA)	96		-		67-153	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS		LCSD		%Recovery		RPD	
	%Recovery	Qual	%Recovery	Qual	Limits	RPD	Qual	Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02,10 Batch: WG1700293-2								
Perfluorotridecanoic Acid (PFTrDA)	108		-		48-158	-		30
Perfluorotetradecanoic Acid (PFTA)	98		-		59-182	-		30

Surrogate (Extracted Internal Standard)	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Perfluoro[13C4]Butanoic Acid (MPFBA)	101				58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	104				62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	112				70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	85				12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	100				57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	99				60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	113				71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	106				62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	84				14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	94				59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	102				69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	96				62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	82				10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	70				24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	99				55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	51				5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	68				27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	94				48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	91				22-136

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,03-09,11-20 Batch: WG1700387-2								
Perfluorobutanoic Acid (PFBA)	94		-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	96		-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	97		-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	105		-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	99		-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	101		-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	95		-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	109		-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	94		-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	97		-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	103		-		70-132	-		30
Perfluorononanoic Acid (PFNA)	91		-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	102		-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	98		-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	100		-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	88		-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	102		-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	104		-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	82		-		59-134	-		30
Perfluorooctanesulfonamide (FOSA)	87		-		67-137	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	108		-		61-139	-		30
Perfluorododecanoic Acid (PFDoA)	105		-		69-135	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS		LCSD		%Recovery		RPD	
	%Recovery	Qual	%Recovery	Qual	Limits	RPD	Qual	Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,03-09,11-20 Batch: WG1700387-2								
Perfluorotridecanoic Acid (PFTrDA)	114		-		66-139	-		30
Perfluorotetradecanoic Acid (PFTA)	103		-		69-133	-		30

Surrogate (Extracted Internal Standard)	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Perfluoro[13C4]Butanoic Acid (MPFBA)	42	Q			61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	45	Q			58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	67	Q			74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	52				14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	48	Q			66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	51	Q			71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	66	Q			78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	56	Q			75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	57				20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	53	Q			72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	57	Q			79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	52	Q			75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	52				19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	29	Q			31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	50	Q			61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	1	Q			5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	28	Q			34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	44	Q			54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	21	Q			24-159

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,03-09,11-20 Batch: WG1700387-2								
Perfluorooctanesulfonamide (FOSA)	110		-		67-137	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	78				5-117

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS	Qual	LCSD	Qual	%Recovery	RPD	Qual	RPD
	%Recovery		%Recovery		Limits			Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 13 Batch: WG1710149-2								
Perfluorobutanoic Acid (PFBA)	104		-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	107		-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	98		-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	124		-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	106		-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	109		-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	98		-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	114		-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	100		-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	118		-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	104		-		70-132	-		30
Perfluorononanoic Acid (PFNA)	111		-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	117		-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	110		-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	91		-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	110		-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	91		-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	116		-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	96		-		59-134	-		30
Perfluorooctanesulfonamide (FOSA)	106		-		67-137	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	92		-		61-139	-		30
Perfluorododecanoic Acid (PFDoA)	104		-		69-135	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

Parameter	LCS		LCSD		%Recovery		RPD	
	%Recovery	Qual	%Recovery	Qual	Limits	RPD	Qual	Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 13 Batch: WG1710149-2								
Perfluorotridecanoic Acid (PFTrDA)	102		-		66-139	-		30
Perfluorotetradecanoic Acid (PFTA)	86		-		69-133	-		30

Surrogate (Extracted Internal Standard)	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
Perfluoro[13C4]Butanoic Acid (MPFBA)	79				61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	83				58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88				74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	63				14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	83				66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	87				71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	96				78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	97				75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	95				20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	91				72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	93				79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	91				75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	124				19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	84				31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	105				61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	24				5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	86				34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	95				54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	98				24-159

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Project Number: G-5078

Lab Number: L2254870

Report Date: 03/08/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 13 Batch: WG1710149-2								
Perfluorooctanesulfonamide (FOSA)	99		-		67-137	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	80				5-117

Matrix Spike Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02,10 QC Batch ID: WG1700293-3 QC Sample: L2255031-01 Client ID: MS Sample												
Perfluorobutanoic Acid (PFBA)	55.0	39.6	91.5	92		-	-		67-148	-		30
Perfluoropentanoic Acid (PFPeA)	24.7	39.6	64.8	101		-	-		63-161	-		30
Perfluorobutanesulfonic Acid (PFBS)	28.8	35.1	65.8	105		-	-		65-157	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	37.1	44.1	119		-	-		37-219	-		30
Perfluorohexanoic Acid (PFHxA)	25.2	39.6	66.8	105		-	-		69-168	-		30
Perfluoropentanesulfonic Acid (PFPeS)	1.91	37.2	37.9	97		-	-		52-156	-		30
Perfluoroheptanoic Acid (PFHpA)	9.61	39.6	51.0	105		-	-		58-159	-		30
Perfluorohexanesulfonic Acid (PFHxS)	8.98	36.2	50.9	116		-	-		69-177	-		30
Perfluorooctanoic Acid (PFOA)	20.3	39.6	60.4	101		-	-		63-159	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	37.6	44.6	114		-	-		49-187	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	37.7	44.0	117		-	-		61-179	-		30
Perfluorononanoic Acid (PFNA)	3.03	39.6	44.0	104		-	-		68-171	-		30
Perfluorooctanesulfonic Acid (PFOS)	13.5	36.7	56.2	116		-	-		52-151	-		30
Perfluorodecanoic Acid (PFDA)	ND	39.6	40.7	100		-	-		63-171	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	38	43.9	116		-	-		56-173	-		30
Perfluorononanesulfonic Acid (PFNS)	ND	38	40.6	107		-	-		48-150	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	39.6	43.1	109		-	-		60-166	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	39.6	45.5	115		-	-		60-153	-		30
Perfluorodecanesulfonic Acid (PFDS)	ND	38.2	36.7	96		-	-		38-156	-		30
Perfluorooctanesulfonamide (FOSA)	ND	39.6	40.6	103		-	-		46-170	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	39.6	39.5	100		-	-		45-170	-		30
Perfluorododecanoic Acid (PFDoA)	ND	39.6	41.5	105		-	-		67-153	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02,10 QC Batch ID: WG1700293-3 QC Sample: L2255031-01 Client ID: MS Sample												
Perfluorotridecanoic Acid (PFTTrDA)	ND	39.6	41.6	105		-	-		48-158	-		30
Perfluorotetradecanoic Acid (PFTTA)	ND	39.6	41.7	105		-	-		59-182	-		30

<i>Surrogate (Extracted Internal Standard)</i>	<i>MS % Recovery</i>	<i>Qualifier</i>	<i>MSD % Recovery</i>	<i>Qualifier</i>	<i>Acceptance Criteria</i>
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	99				10-162
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	134				12-142
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	137				14-147
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	52				27-126
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	54				24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUUDA)	78				55-137
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	84				62-124
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	65				57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	76				60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	95				71-134
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	67				48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	75				22-136
Perfluoro[13C4]Butanoic Acid (MPFBA)	91				58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	66				62-163
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	35				5-112
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	87				69-131
Perfluoro[13C8]Octanoic Acid (M8PFOA)	97				62-129
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	86				59-139
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	76				70-131

Matrix Spike Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,03-09,11-20 QC Batch ID: WG1700387-3 QC Sample: L2254870-01 Client ID: S-11												
Perfluorobutanoic Acid (PFBA)	ND	5.52	5.36	96		-	-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	ND	5.52	5.41	96		-	-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	ND	4.9	4.53	92		-	-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	5.18	5.47	106		-	-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	ND	5.52	5.44	96		-	-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	5.2	4.98	96		-	-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	ND	5.52	5.37	96		-	-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	5.05	5.65	107		-	-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	0.297	5.52	5.26	90		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	5.26	5.14	98		-	-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	5.27	5.00	95		-	-		70-132	-		30
Perfluorononanoic Acid (PFNA)	ND	5.52	5.39	93		-	-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	6.24	5.13	11.6	105		-	-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	0.624	5.52	5.63	91		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	5.3	5.94	112		-	-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	ND	5.31	5.00	94		-	-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	5.52	5.02	91		-	-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	5.52	5.72	99		-	-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	ND	5.34	5.01	94		-	-		59-134	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	5.52	5.47	99		-	-		61-139	-		30
Perfluorododecanoic Acid (PFDoA)	ND	5.52	5.80	101		-	-		69-135	-		30
Perfluorotridecanoic Acid (PFTrDA)	ND	5.52	6.40	116		-	-		66-139	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,03-09,11-20 QC Batch ID: WG1700387-3 QC Sample: L2254870-01 Client ID: S-11												
Perfluorotetradecanoic Acid (PFTA)	ND	5.52	5.55	99		-	-		69-133	-		30

<i>Surrogate (Extracted Internal Standard)</i>	<i>MS</i>		<i>MSD</i>		<i>Acceptance Criteria</i>
	<i>% Recovery</i>	<i>Qualifier</i>	<i>% Recovery</i>	<i>Qualifier</i>	
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	99				19-175
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	77				14-167
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	91				20-154
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	54				34-137
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	55				31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	94				61-155
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	90				75-130
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	87				66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	86				71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	98				78-139
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	78				54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	57				24-159
Perfluoro[13C4]Butanoic Acid (MPFBA)	86				61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	84				58-150
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	92				79-136
Perfluoro[13C8]Octanoic Acid (M8PFOA)	95				75-130
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	90				72-140
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	96				74-139

Matrix Spike Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,03-09,11-20 QC Batch ID: WG1700387-3 QC Sample: L2254870-01 Client ID: S-11												
Perfluorooctanesulfonamide (FOSA)	ND	5.52	5.14	93		-	-		67-137	-		30

Surrogate (Extracted Internal Standard)	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	81				5-117

Matrix Spike Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

<i>Parameter</i>	<i>Native Sample</i>	<i>MS Added</i>	<i>MS Found</i>	<i>MS %Recovery</i>	<i>Qual</i>	<i>MSD Found</i>	<i>MSD %Recovery</i>	<i>Qual</i>	<i>Recovery Limits</i>	<i>RPD</i>	<i>Qual</i>	<i>RPD Limits</i>
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 13 QC Batch ID: WG1710149-3 QC Sample: L2261192-01 Client ID: MS Sample												
Perfluorobutanoic Acid (PFBA)	ND	6.62	7.03	102		-	-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	ND	6.62	7.09	105		-	-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	ND	5.88	5.98	102		-	-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	6.21	7.92	128		-	-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	ND	6.62	7.01	105		-	-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	6.24	6.66	107		-	-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	ND	6.62	6.60	98		-	-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	6.05	7.19	119		-	-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	ND	6.62	7.07	102		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	6.3	6.65	106		-	-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	6.32	6.44	102		-	-		70-132	-		30
Perfluorononanoic Acid (PFNA)	ND	6.62	7.92	117		-	-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	0.738	6.14	7.94	117		-	-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	ND	6.62	7.73	117		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	6.36	5.97	94		-	-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	ND	6.37	7.33	115		-	-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	6.62	6.07F	92		-	-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	6.62	7.95	119		-	-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	ND	6.4	5.73	90		-	-		59-134	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	6.62	6.48	98		-	-		61-139	-		30
Perfluorododecanoic Acid (PFDoA)	ND	6.62	7.24	109		-	-		69-135	-		30
Perfluorotridecanoic Acid (PFTrDA)	ND	6.62	6.53	99		-	-		66-139	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 13 QC Batch ID: WG1710149-3 QC Sample: L2261192-01 Client ID: MS Sample												
Perfluorotetradecanoic Acid (PFTA)	ND	6.62	6.13F	93		-	-		69-133	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	64.6	82.3F	127		-	-		41-165	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	6.26	4.37	70		-	-		61-135	-		30
Perfluorohexadecanoic Acid (PFHxDA)	ND	6.62	7.05	106		-	-		18-191	-		30
Perfluorooctadecanoic Acid (PFODA)	ND	6.62	ND	48		-	-		10-123	-		30

Surrogate (Extracted Internal Standard)	MS % Recovery	MS Qualifier	MSD % Recovery	MSD Qualifier	Acceptance Criteria
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	79				19-175
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	36				14-167
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	60				20-154
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	45				10-203
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	16	Q			34-137
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	13	Q			31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	57	Q			61-155
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	51	Q			75-130
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	33	Q			66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	35	Q			71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	64	Q			78-139
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	55				54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	73				24-159
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	90				10-145
Perfluoro[13C4]Butanoic Acid (MPFBA)	33	Q			61-135

Matrix Spike Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
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Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 13 QC Batch ID: WG1710149-3 QC Sample: L2261192-01 Client ID: MS Sample

Surrogate (Extracted Internal Standard)	MS % Recovery	Qualifier	MSD % Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	34	Q			58-150
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	65	Q			79-136
Perfluoro[13C8]Octanoic Acid (M8PFOA)	43	Q			75-130
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	41	Q			72-140
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	59	Q			74-139

Lab Duplicate Analysis
Batch Quality Control

Project Name: DUNSTABLE-GROTON

Project Number: G-5078

Lab Number: L2254870

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 02,10 QC Batch ID: WG1700293-4 QC Sample: L2255347-01 Client ID: DUP Sample						
Perfluorooctanoic Acid (PFOA)	ND	ND	ng/l	NC		30
Perfluorooctanesulfonic Acid (PFOS)	ND	ND	ng/l	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanoic Acid (M8PFOA)	85		86		62-129
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	96		91		69-131



Lab Duplicate Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Project Number: G-5078

Lab Number: L2254870

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,03-09,11-20 QC Batch ID: WG1700387-4 QC Sample: L2254870-03 Client ID: S-12						
Perfluorobutanoic Acid (PFBA)	ND	ND	ng/g	NC		30
Perfluoropentanoic Acid (PFPeA)	ND	ND	ng/g	NC		30
Perfluorobutanesulfonic Acid (PFBS)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/g	NC		30
Perfluorohexanoic Acid (PFHxA)	ND	ND	ng/g	NC		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	ND	ng/g	NC		30
Perfluoroheptanoic Acid (PFHpA)	ND	ND	ng/g	NC		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	ND	ng/g	NC		30
Perfluorooctanoic Acid (PFOA)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/g	NC		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/g	NC		30
Perfluorononanoic Acid (PFNA)	ND	ND	ng/g	NC		30
Perfluorooctanesulfonic Acid (PFOS)	5.80	5.14	ng/g	12		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/g	NC		30
Perfluorononanesulfonic Acid (PFNS)	ND	ND	ng/g	NC		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	ND	ng/g	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/g	NC		30
Perfluorodecanesulfonic Acid (PFDS)	ND	ND	ng/g	NC		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	ND	ng/g	NC		30

Lab Duplicate Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Project Number: G-5078

Lab Number: L2254870

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,03-09,11-20 QC Batch ID: WG1700387-4 QC Sample: L2254870-03 Client ID: S-12						
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/g	NC		30
Perfluorotridecanoic Acid (PFTrDA)	ND	ND	ng/g	NC		30
Perfluorotetradecanoic Acid (PFTA)	ND	ND	ng/g	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	74		73		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	76		74		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	91		91		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	69		70		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	74		75		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	76		76		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	92		91		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	85		87		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	80		81		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	82		82		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	85		88		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	79		77		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	85		87		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	40		37		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	81		75		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	28	Q	23	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	63		59		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	10	Q	10	Q	24-159

Lab Duplicate Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Project Number: G-5078

Lab Number: L2254870

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01,03-09,11-20 QC Batch ID: WG1700387-4 QC Sample: L2254870-03 Client ID: S-12						
Perfluorooctanesulfonamide (FOSA)	ND	ND	ng/g	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	75		72		5-117

Lab Duplicate Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Project Number: G-5078

Lab Number: L2254870

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 13 QC Batch ID: WG1710149-4 QC Sample: L2261192-02 Client ID: DUP Sample						
Perfluorobutanoic Acid (PFBA)	ND	ND	ng/g	NC		30
Perfluoropentanoic Acid (PFPeA)	ND	ND	ng/g	NC		30
Perfluorobutanesulfonic Acid (PFBS)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/g	NC		30
Perfluorohexanoic Acid (PFHxA)	ND	ND	ng/g	NC		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	ND	ng/g	NC		30
Perfluoroheptanoic Acid (PFHpA)	ND	ND	ng/g	NC		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	ND	ng/g	NC		30
Perfluorooctanoic Acid (PFOA)	0.579	0.601F	ng/g	4		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/g	NC		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/g	NC		30
Perfluorononanoic Acid (PFNA)	ND	ND	ng/g	NC		30
Perfluorooctanesulfonic Acid (PFOS)	5.00	4.36	ng/g	14		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/g	NC		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/g	NC		30
Perfluorononanesulfonic Acid (PFNS)	ND	ND	ng/g	NC		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	ND	ng/g	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/g	NC		30
Perfluorodecanesulfonic Acid (PFDS)	ND	ND	ng/g	NC		30
Perfluorooctanesulfonamide (FOSA)	ND	ND	ng/g	NC		30

Lab Duplicate Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Project Number: G-5078

Lab Number: L2254870

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 13 QC Batch ID: WG1710149-4 QC Sample: L2261192-02 Client ID: DUP Sample						
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	ND	ng/g	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/g	NC		30
Perfluorotridecanoic Acid (PFTTrDA)	ND	ND	ng/g	NC		30
Perfluorotetradecanoic Acid (PFTA)	ND	ND	ng/g	NC		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	ND	ng/g	NC		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	ND	ng/g	NC		30
Perfluorohexadecanoic Acid (PFHxDA)	ND	ND	ng/g	NC		30
Perfluorooctadecanoic Acid (PFODA)	ND	ND	ng/g	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	52	Q	63		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	53	Q	64		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	85		85		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	59		63		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	54	Q	64	Q	66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	57	Q	64	Q	71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	98		96		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	69	Q	75		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	100		105		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	63	Q	65	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	90		96		79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	69	Q	80		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	174		139		19-175

Lab Duplicate Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Project Number: G-5078

Lab Number: L2254870

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 13 QC Batch ID: WG1710149-4 QC Sample: L2261192-02 Client ID: DUP Sample						

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	58		60		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	73		81		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	18		12		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	53		52		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	71		82		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	62		75		24-159
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	74		95		10-203
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	102		111		10-145

INORGANICS & MISCELLANEOUS

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-01
Client ID: S-11
Sample Location: GROTON, MA

Date Collected: 10/04/22 13:45
Date Received: 10/04/22
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	86.2		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-03

Date Collected: 10/04/22 14:00

Client ID: S-12

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	65.1		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-04

Date Collected: 10/04/22 14:15

Client ID: S-13

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	83.8		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-05
 Client ID: S-14
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:
 Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	65.9		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-06

Date Collected: 10/04/22 15:15

Client ID: S-15

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	63.0		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-07

Date Collected: 10/04/22 15:25

Client ID: S-16

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	81.6		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-08

Date Collected: 10/04/22 15:35

Client ID: S-17

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	81.9		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-09

Date Collected: 10/04/22 15:45

Client ID: S-18

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	82.6		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-11

Date Collected: 10/04/22 11:40

Client ID: S-1

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	83.2		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-12

Date Collected: 10/04/22 11:30

Client ID: S-2

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	65.4		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-13
 Client ID: S-3
 Sample Location: GROTON, MA

Date Collected: 10/04/22 11:50
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:
 Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	55.4		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-14

Date Collected: 10/04/22 12:00

Client ID: S-4

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	83.5		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-15
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:
 Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	83.1		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-16

Date Collected: 10/04/22 12:30

Client ID: S-6

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	76.3		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-17
 Client ID: S-7
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:40
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:
 Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	65.8		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON

Lab Number: L2254870

Project Number: G-5078

Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-18

Date Collected: 10/04/22 12:50

Client ID: S-8

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	62.3		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

SAMPLE RESULTS

Lab ID: L2254870-19
 Client ID: S-9
 Sample Location: GROTON, MA

Date Collected: 10/04/22 13:05
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:
 Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	64.9		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Project Name: DUNSTABLE-GROTON**Lab Number:** L2254870**Project Number:** G-5078**Report Date:** 03/08/23**SAMPLE RESULTS**

Lab ID: L2254870-20

Date Collected: 10/04/22 13:30

Client ID: S-10

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	64.9		%	0.100	--	1	-	10/13/22 14:42	121,2540G	AL



Lab Duplicate Analysis

Batch Quality Control

Project Name: DUNSTABLE-GROTON

Project Number: G-5078

Lab Number: L2254870

Report Date: 03/08/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 01,03-09,11-20 QC Batch ID: WG1699005-1 QC Sample: L2254870-01 Client ID: S-11						
Solids, Total	86.2	85.7	%	1		10

Project Name: DUNSTABLE-GROTON**Lab Number:** L2254870**Project Number:** G-5078**Report Date:** 03/08/23**Sample Receipt and Container Information**

Were project specific reporting limits specified?

YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2254870-01A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-01B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-02A	Plastic 250ml unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(28)
L2254870-03A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-03B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-04A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-04B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-05A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-05B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-06A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-06B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-07A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-07B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-08A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-08B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-09A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-09B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-10A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(28)
L2254870-10B	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(28)
L2254870-11A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-11B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-12A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)

Project Name: DUNSTABLE-GROTON**Lab Number:** L2254870**Project Number:** G-5078**Report Date:** 03/08/23**Container Information**

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2254870-12B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-13A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-13B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-14A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-14B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-15A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-15B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-16A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-16B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-17A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-17B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-18A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-18B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-19A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-19B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)
L2254870-20A	Plastic 8oz unpreserved	A	NA		2.2	Y	Absent		A2-537-ISOTOPE(90)
L2254870-20B	Plastic 2oz unpreserved for TS	A	NA		2.2	Y	Absent		A2-TS(7)

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Serial_No:03082315:27
Lab Number: L2254870
Report Date: 03/08/23

PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
PERFLUOROALKYL CARBOXYLIC ACIDS (PFCAs)		
Perfluorooctadecanoic Acid	PFODA	16517-11-6
Perfluorohexadecanoic Acid	PFHxDA	67905-19-5
Perfluorotetradecanoic Acid	PFTA/PFTeDA	376-06-7
Perfluorotridecanoic Acid	PFTrDA	72629-94-8
Perfluorododecanoic Acid	PFDoA	307-55-1
Perfluoroundecanoic Acid	PFUnA	2058-94-8
Perfluorodecanoic Acid	PFDA	335-76-2
Perfluorononanoic Acid	PFNA	375-95-1
Perfluorooctanoic Acid	PFOA	335-67-1
Perfluoroheptanoic Acid	PFHpA	375-85-9
Perfluorohexanoic Acid	PFHxA	307-24-4
Perfluoropentanoic Acid	PFPeA	2706-90-3
Perfluorobutanoic Acid	PFBA	375-22-4
PERFLUOROALKYL SULFONIC ACIDS (PFSAs)		
Perfluorododecanesulfonic Acid	PFDoDS/PFDoS	79780-39-5
Perfluorodecanesulfonic Acid	PFDS	335-77-3
Perfluorononanesulfonic Acid	PFNS	68259-12-1
Perfluorooctanesulfonic Acid	PFOS	1763-23-1
Perfluoroheptanesulfonic Acid	PFHpS	375-92-8
Perfluorohexanesulfonic Acid	PFHxS	355-46-4
Perfluoropentanesulfonic Acid	PFPeS	2706-91-4
Perfluorobutanesulfonic Acid	PFBS	375-73-5
Perfluoropropanesulfonic Acid	PFPrS	423-41-6
FLUOROTELOMERS		
1H,1H,2H,2H-Perfluorododecanesulfonic Acid	10:2FTS	120226-60-0
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	8:2FTS	39108-34-4
1H,1H,2H,2H-Perfluorooctanesulfonic Acid	6:2FTS	27619-97-2
1H,1H,2H,2H-Perfluorohexanesulfonic Acid	4:2FTS	757124-72-4
PERFLUOROALKANE SULFONAMIDES (FASAs)		
Perfluorooctanesulfonamide	FOSA/PFOSA	754-91-6
N-Ethyl Perfluorooctane Sulfonamide	NEtFOSA	4151-50-2
N-Methyl Perfluorooctane Sulfonamide	NMeFOSA	31506-32-8
PERFLUOROALKANE SULFONYL SUBSTANCES		
N-Ethyl Perfluorooctanesulfonamido Ethanol	NEtFOSE	1691-99-2
N-Methyl Perfluorooctanesulfonamido Ethanol	NMeFOSE	24448-09-7
N-Ethyl Perfluorooctanesulfonamidoacetic Acid	NEtFOSAA	2991-50-6
N-Methyl Perfluorooctanesulfonamidoacetic Acid	NMeFOSAA	2355-31-9
PER- and POLYFLUOROALKYL ETHER CARBOXYLIC ACIDS		
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid	HFPO-DA	13252-13-6
4,8-Dioxa-3h-Perfluorononanoic Acid	ADONA	919005-14-4
CHLORO-PERFLUOROALKYL SULFONIC ACIDS		
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid	11Cl-PF3OUdS	763051-92-9
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	9Cl-PF3ONS	756426-58-1
PERFLUOROETHER SULFONIC ACIDS (PFESAs)		
Perfluoro(2-Ethoxyethane)Sulfonic Acid	PFEEA	113507-82-7
PERFLUOROETHER/POLYETHER CARBOXYLIC ACIDS (PFPCAs)		
Perfluoro-3-Methoxypropanoic Acid	PFMPA	377-73-1
Perfluoro-4-Methoxybutanoic Acid	PFMBA	863090-89-5
Nonafluoro-3,6-Dioxaheptanoic Acid	NFDHA	151772-58-6

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Serial_No:03082315:27
Lab Number: L2254870
Report Date: 03/08/23

PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
FLUOROTELOMER CARBOXYLIC ACIDS (FTCAs)		
3-Perfluoroheptyl Propanoic Acid	7:3FTCA	812-70-4
2H,2H,3H,3H-Perfluorooctanoic Acid	5:3FTCA	914637-49-3
3-Perfluoropropyl Propanoic Acid	3:3FTCA	356-02-5

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report



Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

Data Qualifiers

- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name: DUNSTABLE-GROTON
Project Number: G-5078

Lab Number: L2254870
Report Date: 03/08/23

REFERENCES

- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Name: *Dunstable - Groton*
Project Location: *Groton, MA*
Project #: *6-5078*
Project Manager: *Matt Wagner*
ALPHA Quote #:

Date Rec'd in Lab: *10/4/22*

ALPHA Job #: *L2254870*

Client Information

Client: *Tighe + Bond*
Address: *53 Southampton Rd
Westfield MA 01085*
Phone: *413-562-1600*
Email: *mnguid@tighbond.com*

Report Information - Data Deliverables

ADEX EMAIL

Billing Information

Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program _____ Criteria _____

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)

Date Due:

Additional Project Information:

ANALYSIS		SAMPLE INFO	
VOC: <input type="checkbox"/> 8260 <input type="checkbox"/> 824 <input type="checkbox"/> 524.2	SVOC: <input type="checkbox"/> ABN <input type="checkbox"/> PAH	Filtration	<input type="checkbox"/> Field
METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> MCP 15	<input type="checkbox"/> RCRA5 <input type="checkbox"/> RCRA6 <input type="checkbox"/> PP13	<input type="checkbox"/> Lab to do	Preservation
EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	<input type="checkbox"/> Lab to do	
PCB <input type="checkbox"/> PEST	TPH: <input type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint		
<i>PHAS</i>			
Sample Comments			

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials
		Date	Time		
<i>4870-01</i>	<i>S-11</i>	<i>10/4/22</i>	<i>1345</i>	<i>S</i>	<i>NG</i>
<i>-02</i>	<i>field Blank</i>		<i>1355</i>		
<i>-03</i>	<i>S-12</i>		<i>1400</i>		
<i>-04</i>	<i>S-13</i>		<i>1415</i>		
<i>-05</i>	<i>S-14</i>		<i>1435</i>		
<i>-06</i>	<i>S-15</i>		<i>1515</i>		
<i>-07</i>	<i>S-16</i>		<i>1525</i>		
<i>-08</i>	<i>S-17</i>		<i>1535</i>		
<i>-09</i>	<i>S-18</i>		<i>1545</i>		
<i>-10</i>	<i>Equipment Blank</i>		<i>1600</i>		

- Container Type**
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle
- Preservative**
A= None
B= HCl
C= HNO₃
D= H₂SO₄
E= NaOH
F= MeOH
G= NaHSO₄
H= Na₂S₂O₈
I= Ascorbic Acid
J= NH₄Cl
K= Zn Acetate
O= Other

Container Type	
Preservative	

Relinquished By:	Date/Time	Received By:	Date/Time
<i>W. J. [Signature]</i>	<i>10/4/22 16:50</i>	<i>W. J. [Signature]</i>	<i>10/4/22 16:50</i>
<i>[Signature]</i>	<i>10/4/22 17:55</i>	<i>[Signature]</i>	<i>10/4/22 17:55</i>
<i>[Signature]</i>	<i>10/4/22 19:30</i>	<i>[Signature]</i>	<i>10/4/22 19:30</i>

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.



CHAIN OF CUSTODY

PAGE 2 OF 2

WESTBORO, MA
TEL: 508-898-8220
FAX: 508-898-9193

MANSFIELD, MA
TEL: 508-822-9300
FAX: 508-822-3288

Project Information

Project Name: G-5076

Project Location:

Project #:

Project Manager:

ALPHA Quote #:

Turn-Around Time

Standard RUSH (only confirmed if pre-approved!)

Date Due: _____ Time: _____

Date Rec'd in Lab: 10/4/22

ALPHA Job #: L2254870

Report Information - Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

Same as Client info PO #:

Regulatory Requirements/Report Limits

State /Fed Program _____ Criteria _____

Client Information

Client:

Address:

see p.1

Phone:

Fax:

Email:

These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

ANALYSIS	PFAS	SAMPLE HANDLING
	SWCS, RES/Herb TPH, PCBs RCRA 8 Metals SPECIFIC CONA.	
		Filtration _____
		<input type="checkbox"/> Done
		<input type="checkbox"/> Not needed
		<input type="checkbox"/> Lab to do
		Preservation _____
		<input type="checkbox"/> Lab to do
		(Please specify below)
		Sample Specific Comments

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials					
		Date	Time							
4870-11	S-1	10/4/22	1140	S	NG	✓				
12	S-2		1130			✓				
13	S-3		1150			✓				
-14	S-4		1200			✓				
-15	S-5		1215			✓				
-16	S-6		1230			✓				
-17	S-7		1240			✓				
-18	S-8		1250			✓				
-19	S-9		1305			✓				
-20	S-10		1330			✓				

Container Type

Preservative

Relinquished By: <u>[Signature]</u>	Date/Time: <u>10/4/22 16:50</u>	Received By: <u>[Signature]</u>	Date/Time: <u>10/4/22 16:50</u>
<u>[Signature]</u>	<u>10/4/22 17:55</u>	<u>[Signature]</u>	<u>10/4/22 17:55</u>
<u>[Signature]</u>	<u>10/4/22 19:30</u>	<u>[Signature]</u>	<u>10/4/22 19:30</u>

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.



ANALYTICAL REPORT

Lab Number:	L2254865
Client:	Tighe & Bond, Inc. 53 Southampton Road Westfield, MA 01085
ATTN:	Nick Guidi
Phone:	(508) 244-8466
Project Name:	DUNSTABLE - GROTON
Project Number:	G-5078
Report Date:	10/18/22

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com



Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2254865-01	S-5	SOIL	GROTON, MA	10/04/22 12:15	10/04/22
L2254865-02	S-12	SOIL	GROTON, MA	10/04/22 14:00	10/04/22
L2254865-03	S-17	SOIL	GROTON, MA	10/04/22 15:35	10/04/22

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

MADEP MCP Response Action Analytical Report Certification

This form provides certifications for all samples performed by MCP methods. Please refer to the Sample Results and Container Information sections of this report for specification of MCP methods used for each analysis. The following questions pertain only to MCP Analytical Methods.

An affirmative response to questions A through F is required for "Presumptive Certainty" status		
A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	YES
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	YES
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	YES
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data?"	YES
E a.	VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications).	N/A
E b.	APH and TO-15 Methods only: Was the complete analyte list reported for each method?	N/A
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	YES
A response to questions G, H and I is required for "Presumptive Certainty" status		
G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	NO
H	Were all QC performance standards specified in the CAM protocol(s) achieved?	NO
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	NO
For any questions answered "No", please refer to the case narrative section on the following page(s).		

Please note that sample matrix information is located in the Sample Results section of this report.



Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Case Narrative (continued)

MCP Related Narratives

Sample Receipt

In reference to question H:

A Matrix Spike was not submitted for the analysis of Total Metals.

Volatile Organics

In reference to question G:

L2254865-01 through -03: One or more of the target analytes did not achieve the requested CAM reporting limits.

In reference to question H:

L2254865-01 through -03: Initial Calibration did not meet:

Lowest Calibration Standard Minimum Response Factor: 1,4-dioxane (0.0033)

Average Response Factor: 1,4-dioxane

L2254865-01 through -03: The associated continuing calibration standard is outside the acceptance criteria for several compounds; however, it is within overall method allowances. Associated results are considered to be biased high if the %D is negative and biased low if the %D is positive. A copy of the continuing calibration standard is included as an addendum to this report.

Semivolatile Organics

L2254865-01, -02, and -03: The initial calibration utilized a quadratic fit for 2,4-Dinitrophenol.

Total Metals

In reference to question I:

All samples were analyzed for a subset of MCP analytes per client request.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:

 Cristin Walker

Title: Technical Director/Representative

Date: 10/18/22

QC OUTLIER SUMMARY REPORT

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

Method	Client ID (Native ID)	Lab ID	Parameter	QC Type	Recovery/RPD (%)	QC Limits (%)	Associated Samples	Data Quality Assessment
MCP Volatile Organics by EPA 5035 High - Westborough Lab								
8260D	Batch QC	WG1699160-3	Chloromethane	LCS	63	70-130	01-03	potential low bias
8260D	Batch QC	WG1699160-3	Acetone	LCS	69	70-130	01-03	potential low bias
8260D	Batch QC	WG1699160-3	Methyl ethyl ketone	LCS	59	70-130	01-03	potential low bias
8260D	Batch QC	WG1699160-3	2-Hexanone	LCS	69	70-130	01-03	potential low bias
8260D	Batch QC	WG1699160-3	Tetrahydrofuran	LCS	68	70-130	01-03	potential low bias
8260D	Batch QC	WG1699160-4	Chloromethane	LCSD	61	70-130	01-03	potential low bias
8260D	Batch QC	WG1699160-4	Methyl ethyl ketone	LCSD	65	70-130	01-03	potential low bias
MCP Semivolatile Organics - Westborough Lab								
8270E	S-12	L2254865-02	4-Terphenyl-d14	Surrogate	28	30-130	-	potential low bias

ORGANICS

VOLATILES

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-01
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 141,8260D
 Analytical Date: 10/12/22 11:20
 Analyst: JIC
 Percent Solids: 78%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	400	--	1
1,1-Dichloroethane	ND		ug/kg	80	--	1
Chloroform	ND		ug/kg	120	--	1
Carbon tetrachloride	ND		ug/kg	80	--	1
1,2-Dichloropropane	ND		ug/kg	80	--	1
Dibromochloromethane	ND		ug/kg	80	--	1
1,1,2-Trichloroethane	ND		ug/kg	80	--	1
Tetrachloroethene	ND		ug/kg	40	--	1
Chlorobenzene	ND		ug/kg	40	--	1
Trichlorofluoromethane	ND		ug/kg	320	--	1
1,2-Dichloroethane	ND		ug/kg	80	--	1
1,1,1-Trichloroethane	ND		ug/kg	40	--	1
Bromodichloromethane	ND		ug/kg	40	--	1
trans-1,3-Dichloropropene	ND		ug/kg	80	--	1
cis-1,3-Dichloropropene	ND		ug/kg	40	--	1
1,3-Dichloropropene, Total	ND		ug/kg	40	--	1
1,1-Dichloropropene	ND		ug/kg	40	--	1
Bromoform	ND		ug/kg	320	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	40	--	1
Benzene	ND		ug/kg	40	--	1
Toluene	ND		ug/kg	80	--	1
Ethylbenzene	ND		ug/kg	80	--	1
Chloromethane	ND		ug/kg	320	--	1
Bromomethane	ND		ug/kg	160	--	1
Vinyl chloride	ND		ug/kg	80	--	1
Chloroethane	ND		ug/kg	160	--	1
1,1-Dichloroethene	ND		ug/kg	80	--	1
trans-1,2-Dichloroethene	ND		ug/kg	120	--	1

Project Name: DUNSTABLE - GROTON**Lab Number:** L2254865**Project Number:** G-5078**Report Date:** 10/18/22**SAMPLE RESULTS**

Lab ID: L2254865-01
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	40	--	1
1,2-Dichlorobenzene	ND		ug/kg	160	--	1
1,3-Dichlorobenzene	ND		ug/kg	160	--	1
1,4-Dichlorobenzene	ND		ug/kg	160	--	1
Methyl tert butyl ether	ND		ug/kg	160	--	1
p/m-Xylene	ND		ug/kg	160	--	1
o-Xylene	ND		ug/kg	80	--	1
Xylenes, Total	ND		ug/kg	80	--	1
cis-1,2-Dichloroethene	ND		ug/kg	80	--	1
1,2-Dichloroethene, Total	ND		ug/kg	80	--	1
Dibromomethane	ND		ug/kg	160	--	1
1,2,3-Trichloropropane	ND		ug/kg	160	--	1
Styrene	ND		ug/kg	80	--	1
Dichlorodifluoromethane	ND		ug/kg	800	--	1
Acetone	ND		ug/kg	800	--	1
Carbon disulfide	ND		ug/kg	800	--	1
Methyl ethyl ketone	ND		ug/kg	800	--	1
Methyl isobutyl ketone	ND		ug/kg	800	--	1
2-Hexanone	ND		ug/kg	800	--	1
Bromochloromethane	ND		ug/kg	160	--	1
Tetrahydrofuran	ND		ug/kg	320	--	1
2,2-Dichloropropane	ND		ug/kg	160	--	1
1,2-Dibromoethane	ND		ug/kg	80	--	1
1,3-Dichloropropane	ND		ug/kg	160	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	40	--	1
Bromobenzene	ND		ug/kg	160	--	1
n-Butylbenzene	ND		ug/kg	80	--	1
sec-Butylbenzene	ND		ug/kg	80	--	1
tert-Butylbenzene	ND		ug/kg	160	--	1
o-Chlorotoluene	ND		ug/kg	160	--	1
p-Chlorotoluene	ND		ug/kg	160	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	240	--	1
Hexachlorobutadiene	ND		ug/kg	320	--	1
Isopropylbenzene	ND		ug/kg	80	--	1
p-Isopropyltoluene	ND		ug/kg	80	--	1
Naphthalene	ND		ug/kg	320	--	1
n-Propylbenzene	ND		ug/kg	80	--	1

Project Name: DUNSTABLE - GROTON**Lab Number:** L2254865**Project Number:** G-5078**Report Date:** 10/18/22**SAMPLE RESULTS**

Lab ID: L2254865-01

Date Collected: 10/04/22 12:15

Client ID: S-5

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	160	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	160	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	160	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	160	--	1
Diethyl ether	ND		ug/kg	160	--	1
Diisopropyl Ether	ND		ug/kg	160	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	160	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	160	--	1
1,4-Dioxane	ND		ug/kg	6400	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	124		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	95		70-130

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-02
 Client ID: S-12
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 141,8260D
 Analytical Date: 10/12/22 11:41
 Analyst: JIC
 Percent Solids: 81%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	380	--	1
1,1-Dichloroethane	ND		ug/kg	76	--	1
Chloroform	ND		ug/kg	110	--	1
Carbon tetrachloride	ND		ug/kg	76	--	1
1,2-Dichloropropane	ND		ug/kg	76	--	1
Dibromochloromethane	ND		ug/kg	76	--	1
1,1,2-Trichloroethane	ND		ug/kg	76	--	1
Tetrachloroethene	ND		ug/kg	38	--	1
Chlorobenzene	ND		ug/kg	38	--	1
Trichlorofluoromethane	ND		ug/kg	300	--	1
1,2-Dichloroethane	ND		ug/kg	76	--	1
1,1,1-Trichloroethane	ND		ug/kg	38	--	1
Bromodichloromethane	ND		ug/kg	38	--	1
trans-1,3-Dichloropropene	ND		ug/kg	76	--	1
cis-1,3-Dichloropropene	ND		ug/kg	38	--	1
1,3-Dichloropropene, Total	ND		ug/kg	38	--	1
1,1-Dichloropropene	ND		ug/kg	38	--	1
Bromoform	ND		ug/kg	300	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	38	--	1
Benzene	ND		ug/kg	38	--	1
Toluene	ND		ug/kg	76	--	1
Ethylbenzene	ND		ug/kg	76	--	1
Chloromethane	ND		ug/kg	300	--	1
Bromomethane	ND		ug/kg	150	--	1
Vinyl chloride	ND		ug/kg	76	--	1
Chloroethane	ND		ug/kg	150	--	1
1,1-Dichloroethene	ND		ug/kg	76	--	1
trans-1,2-Dichloroethene	ND		ug/kg	110	--	1

Project Name: DUNSTABLE - GROTON**Lab Number:** L2254865**Project Number:** G-5078**Report Date:** 10/18/22**SAMPLE RESULTS**

Lab ID: L2254865-02
 Client ID: S-12
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	38	--	1
1,2-Dichlorobenzene	ND		ug/kg	150	--	1
1,3-Dichlorobenzene	ND		ug/kg	150	--	1
1,4-Dichlorobenzene	ND		ug/kg	150	--	1
Methyl tert butyl ether	ND		ug/kg	150	--	1
p/m-Xylene	ND		ug/kg	150	--	1
o-Xylene	ND		ug/kg	76	--	1
Xylenes, Total	ND		ug/kg	76	--	1
cis-1,2-Dichloroethene	ND		ug/kg	76	--	1
1,2-Dichloroethene, Total	ND		ug/kg	76	--	1
Dibromomethane	ND		ug/kg	150	--	1
1,2,3-Trichloropropane	ND		ug/kg	150	--	1
Styrene	ND		ug/kg	76	--	1
Dichlorodifluoromethane	ND		ug/kg	760	--	1
Acetone	ND		ug/kg	760	--	1
Carbon disulfide	ND		ug/kg	760	--	1
Methyl ethyl ketone	ND		ug/kg	760	--	1
Methyl isobutyl ketone	ND		ug/kg	760	--	1
2-Hexanone	ND		ug/kg	760	--	1
Bromochloromethane	ND		ug/kg	150	--	1
Tetrahydrofuran	ND		ug/kg	300	--	1
2,2-Dichloropropane	ND		ug/kg	150	--	1
1,2-Dibromoethane	ND		ug/kg	76	--	1
1,3-Dichloropropane	ND		ug/kg	150	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	38	--	1
Bromobenzene	ND		ug/kg	150	--	1
n-Butylbenzene	ND		ug/kg	76	--	1
sec-Butylbenzene	ND		ug/kg	76	--	1
tert-Butylbenzene	ND		ug/kg	150	--	1
o-Chlorotoluene	ND		ug/kg	150	--	1
p-Chlorotoluene	ND		ug/kg	150	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	230	--	1
Hexachlorobutadiene	ND		ug/kg	300	--	1
Isopropylbenzene	ND		ug/kg	76	--	1
p-Isopropyltoluene	ND		ug/kg	76	--	1
Naphthalene	ND		ug/kg	300	--	1
n-Propylbenzene	ND		ug/kg	76	--	1

Project Name: DUNSTABLE - GROTON**Lab Number:** L2254865**Project Number:** G-5078**Report Date:** 10/18/22**SAMPLE RESULTS**

Lab ID: L2254865-02

Date Collected: 10/04/22 14:00

Client ID: S-12

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	150	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	150	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	150	--	1
Diethyl ether	ND		ug/kg	150	--	1
Diisopropyl Ether	ND		ug/kg	150	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	150	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	150	--	1
1,4-Dioxane	ND		ug/kg	6100	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	122		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	96		70-130
Dibromofluoromethane	97		70-130

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-03
 Client ID: S-17
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 141,8260D
 Analytical Date: 10/12/22 12:02
 Analyst: JIC
 Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
Methylene chloride	ND		ug/kg	330	--	1
1,1-Dichloroethane	ND		ug/kg	67	--	1
Chloroform	ND		ug/kg	100	--	1
Carbon tetrachloride	ND		ug/kg	67	--	1
1,2-Dichloropropane	ND		ug/kg	67	--	1
Dibromochloromethane	ND		ug/kg	67	--	1
1,1,2-Trichloroethane	ND		ug/kg	67	--	1
Tetrachloroethene	ND		ug/kg	33	--	1
Chlorobenzene	ND		ug/kg	33	--	1
Trichlorofluoromethane	ND		ug/kg	270	--	1
1,2-Dichloroethane	ND		ug/kg	67	--	1
1,1,1-Trichloroethane	ND		ug/kg	33	--	1
Bromodichloromethane	ND		ug/kg	33	--	1
trans-1,3-Dichloropropene	ND		ug/kg	67	--	1
cis-1,3-Dichloropropene	ND		ug/kg	33	--	1
1,3-Dichloropropene, Total	ND		ug/kg	33	--	1
1,1-Dichloropropene	ND		ug/kg	33	--	1
Bromoform	ND		ug/kg	270	--	1
1,1,2,2-Tetrachloroethane	ND		ug/kg	33	--	1
Benzene	ND		ug/kg	33	--	1
Toluene	ND		ug/kg	67	--	1
Ethylbenzene	ND		ug/kg	67	--	1
Chloromethane	ND		ug/kg	270	--	1
Bromomethane	ND		ug/kg	130	--	1
Vinyl chloride	ND		ug/kg	67	--	1
Chloroethane	ND		ug/kg	130	--	1
1,1-Dichloroethene	ND		ug/kg	67	--	1
trans-1,2-Dichloroethene	ND		ug/kg	100	--	1

Project Name: DUNSTABLE - GROTON**Lab Number:** L2254865**Project Number:** G-5078**Report Date:** 10/18/22**SAMPLE RESULTS**

Lab ID: L2254865-03

Date Collected: 10/04/22 15:35

Client ID: S-17

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
Trichloroethene	ND		ug/kg	33	--	1
1,2-Dichlorobenzene	ND		ug/kg	130	--	1
1,3-Dichlorobenzene	ND		ug/kg	130	--	1
1,4-Dichlorobenzene	ND		ug/kg	130	--	1
Methyl tert butyl ether	ND		ug/kg	130	--	1
p/m-Xylene	ND		ug/kg	130	--	1
o-Xylene	ND		ug/kg	67	--	1
Xylenes, Total	ND		ug/kg	67	--	1
cis-1,2-Dichloroethene	ND		ug/kg	67	--	1
1,2-Dichloroethene, Total	ND		ug/kg	67	--	1
Dibromomethane	ND		ug/kg	130	--	1
1,2,3-Trichloropropane	ND		ug/kg	130	--	1
Styrene	ND		ug/kg	67	--	1
Dichlorodifluoromethane	ND		ug/kg	670	--	1
Acetone	ND		ug/kg	670	--	1
Carbon disulfide	ND		ug/kg	670	--	1
Methyl ethyl ketone	ND		ug/kg	670	--	1
Methyl isobutyl ketone	ND		ug/kg	670	--	1
2-Hexanone	ND		ug/kg	670	--	1
Bromochloromethane	ND		ug/kg	130	--	1
Tetrahydrofuran	ND		ug/kg	270	--	1
2,2-Dichloropropane	ND		ug/kg	130	--	1
1,2-Dibromoethane	ND		ug/kg	67	--	1
1,3-Dichloropropane	ND		ug/kg	130	--	1
1,1,1,2-Tetrachloroethane	ND		ug/kg	33	--	1
Bromobenzene	ND		ug/kg	130	--	1
n-Butylbenzene	ND		ug/kg	67	--	1
sec-Butylbenzene	ND		ug/kg	67	--	1
tert-Butylbenzene	ND		ug/kg	130	--	1
o-Chlorotoluene	ND		ug/kg	130	--	1
p-Chlorotoluene	ND		ug/kg	130	--	1
1,2-Dibromo-3-chloropropane	ND		ug/kg	200	--	1
Hexachlorobutadiene	ND		ug/kg	270	--	1
Isopropylbenzene	ND		ug/kg	67	--	1
p-Isopropyltoluene	ND		ug/kg	67	--	1
Naphthalene	ND		ug/kg	270	--	1
n-Propylbenzene	ND		ug/kg	67	--	1

Project Name: DUNSTABLE - GROTON**Lab Number:** L2254865**Project Number:** G-5078**Report Date:** 10/18/22**SAMPLE RESULTS**

Lab ID: L2254865-03

Date Collected: 10/04/22 15:35

Client ID: S-17

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Volatile Organics by EPA 5035 High - Westborough Lab						
1,2,3-Trichlorobenzene	ND		ug/kg	130	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	130	--	1
1,3,5-Trimethylbenzene	ND		ug/kg	130	--	1
1,2,4-Trimethylbenzene	ND		ug/kg	130	--	1
Diethyl ether	ND		ug/kg	130	--	1
Diisopropyl Ether	ND		ug/kg	130	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/kg	130	--	1
Tertiary-Amyl Methyl Ether	ND		ug/kg	130	--	1
1,4-Dioxane	ND		ug/kg	5300	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	126		70-130
Toluene-d8	99		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	99		70-130

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

Method Blank Analysis Batch Quality Control

Analytical Method: 141,8260D
 Analytical Date: 10/12/22 08:40
 Analyst: NLK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01-03 Batch: WG1699160-5					
Methylene chloride	ND		ug/kg	250	--
1,1-Dichloroethane	ND		ug/kg	50	--
Chloroform	ND		ug/kg	75	--
Carbon tetrachloride	ND		ug/kg	50	--
1,2-Dichloropropane	ND		ug/kg	50	--
Dibromochloromethane	ND		ug/kg	50	--
1,1,2-Trichloroethane	ND		ug/kg	50	--
Tetrachloroethene	ND		ug/kg	25	--
Chlorobenzene	ND		ug/kg	25	--
Trichlorofluoromethane	ND		ug/kg	200	--
1,2-Dichloroethane	ND		ug/kg	50	--
1,1,1-Trichloroethane	ND		ug/kg	25	--
Bromodichloromethane	ND		ug/kg	25	--
trans-1,3-Dichloropropene	ND		ug/kg	50	--
cis-1,3-Dichloropropene	ND		ug/kg	25	--
1,3-Dichloropropene, Total	ND		ug/kg	25	--
1,1-Dichloropropene	ND		ug/kg	25	--
Bromoform	ND		ug/kg	200	--
1,1,2,2-Tetrachloroethane	ND		ug/kg	25	--
Benzene	ND		ug/kg	25	--
Toluene	ND		ug/kg	50	--
Ethylbenzene	ND		ug/kg	50	--
Chloromethane	ND		ug/kg	200	--
Bromomethane	ND		ug/kg	100	--
Vinyl chloride	ND		ug/kg	50	--
Chloroethane	ND		ug/kg	100	--
1,1-Dichloroethene	ND		ug/kg	50	--
trans-1,2-Dichloroethene	ND		ug/kg	75	--
Trichloroethene	ND		ug/kg	25	--

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8260D
Analytical Date: 10/12/22 08:40
Analyst: NLK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01-03 Batch: WG1699160-5					
1,2-Dichlorobenzene	ND		ug/kg	100	--
1,3-Dichlorobenzene	ND		ug/kg	100	--
1,4-Dichlorobenzene	ND		ug/kg	100	--
Methyl tert butyl ether	ND		ug/kg	100	--
p/m-Xylene	ND		ug/kg	100	--
o-Xylene	ND		ug/kg	50	--
Xylenes, Total	ND		ug/kg	50	--
cis-1,2-Dichloroethene	ND		ug/kg	50	--
1,2-Dichloroethene, Total	ND		ug/kg	50	--
Dibromomethane	ND		ug/kg	100	--
1,2,3-Trichloropropane	ND		ug/kg	100	--
Styrene	ND		ug/kg	50	--
Dichlorodifluoromethane	ND		ug/kg	500	--
Acetone	ND		ug/kg	500	--
Carbon disulfide	ND		ug/kg	500	--
Methyl ethyl ketone	ND		ug/kg	500	--
Methyl isobutyl ketone	ND		ug/kg	500	--
2-Hexanone	ND		ug/kg	500	--
Bromochloromethane	ND		ug/kg	100	--
Tetrahydrofuran	ND		ug/kg	200	--
2,2-Dichloropropane	ND		ug/kg	100	--
1,2-Dibromoethane	ND		ug/kg	50	--
1,3-Dichloropropane	ND		ug/kg	100	--
1,1,1,2-Tetrachloroethane	ND		ug/kg	25	--
Bromobenzene	ND		ug/kg	100	--
n-Butylbenzene	ND		ug/kg	50	--
sec-Butylbenzene	ND		ug/kg	50	--
tert-Butylbenzene	ND		ug/kg	100	--
o-Chlorotoluene	ND		ug/kg	100	--

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 141,8260D
Analytical Date: 10/12/22 08:40
Analyst: NLK

Parameter	Result	Qualifier	Units	RL	MDL
MCP Volatile Organics by EPA 5035 High - Westborough Lab for sample(s): 01-03 Batch: WG1699160-5					
p-Chlorotoluene	ND		ug/kg	100	--
1,2-Dibromo-3-chloropropane	ND		ug/kg	150	--
Hexachlorobutadiene	ND		ug/kg	200	--
Isopropylbenzene	ND		ug/kg	50	--
p-Isopropyltoluene	ND		ug/kg	50	--
Naphthalene	ND		ug/kg	200	--
n-Propylbenzene	ND		ug/kg	50	--
1,2,3-Trichlorobenzene	ND		ug/kg	100	--
1,2,4-Trichlorobenzene	ND		ug/kg	100	--
1,3,5-Trimethylbenzene	ND		ug/kg	100	--
1,2,4-Trimethylbenzene	ND		ug/kg	100	--
Diethyl ether	ND		ug/kg	100	--
Diisopropyl Ether	ND		ug/kg	100	--
Ethyl-Tert-Butyl-Ether	ND		ug/kg	100	--
Tertiary-Amyl Methyl Ether	ND		ug/kg	100	--
1,4-Dioxane	ND		ug/kg	4000	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	125		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	93		70-130
Dibromofluoromethane	98		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01-03 Batch: WG1699160-3 WG1699160-4								
Methylene chloride	87		88		70-130	1		20
1,1-Dichloroethane	86		83		70-130	4		20
Chloroform	96		94		70-130	2		20
Carbon tetrachloride	103		98		70-130	5		20
1,2-Dichloropropane	84		83		70-130	1		20
Dibromochloromethane	96		99		70-130	3		20
1,1,2-Trichloroethane	89		93		70-130	4		20
Tetrachloroethene	105		100		70-130	5		20
Chlorobenzene	97		95		70-130	2		20
Trichlorofluoromethane	110		103		70-130	7		20
1,2-Dichloroethane	102		106		70-130	4		20
1,1,1-Trichloroethane	104		100		70-130	4		20
Bromodichloromethane	93		94		70-130	1		20
trans-1,3-Dichloropropene	97		98		70-130	1		20
cis-1,3-Dichloropropene	97		98		70-130	1		20
1,1-Dichloropropene	100		93		70-130	7		20
Bromoform	89		93		70-130	4		20
1,1,1,2-Tetrachloroethane	82		86		70-130	5		20
Benzene	92		89		70-130	3		20
Toluene	92		88		70-130	4		20
Ethylbenzene	96		92		70-130	4		20
Chloromethane	63	Q	61	Q	70-130	3		20
Bromomethane	111		103		70-130	7		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01-03 Batch: WG1699160-3 WG1699160-4								
Vinyl chloride	78		73		70-130	7		20
Chloroethane	80		76		70-130	5		20
1,1-Dichloroethene	96		87		70-130	10		20
trans-1,2-Dichloroethene	92		87		70-130	6		20
Trichloroethene	96		90		70-130	6		20
1,2-Dichlorobenzene	96		96		70-130	0		20
1,3-Dichlorobenzene	96		94		70-130	2		20
1,4-Dichlorobenzene	96		95		70-130	1		20
Methyl tert butyl ether	97		100		70-130	3		20
p/m-Xylene	100		95		70-130	5		20
o-Xylene	99		97		70-130	2		20
cis-1,2-Dichloroethene	90		90		70-130	0		20
Dibromomethane	97		102		70-130	5		20
1,2,3-Trichloropropane	90		96		70-130	6		20
Styrene	98		97		70-130	1		20
Dichlorodifluoromethane	85		80		70-130	6		20
Acetone	69	Q	72		70-130	4		20
Carbon disulfide	88		84		70-130	5		20
Methyl ethyl ketone	59	Q	65	Q	70-130	10		20
Methyl isobutyl ketone	76		79		70-130	4		20
2-Hexanone	69	Q	74		70-130	7		20
Bromochloromethane	95		97		70-130	2		20
Tetrahydrofuran	68	Q	72		70-130	6		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01-03 Batch: WG1699160-3 WG1699160-4								
2,2-Dichloropropane	96		92		70-130	4		20
1,2-Dibromoethane	98		102		70-130	4		20
1,3-Dichloropropane	95		98		70-130	3		20
1,1,1,2-Tetrachloroethane	100		100		70-130	0		20
Bromobenzene	95		92		70-130	3		20
n-Butylbenzene	97		92		70-130	5		20
sec-Butylbenzene	94		88		70-130	7		20
tert-Butylbenzene	93		88		70-130	6		20
o-Chlorotoluene	95		92		70-130	3		20
p-Chlorotoluene	95		92		70-130	3		20
1,2-Dibromo-3-chloropropane	82		87		70-130	6		20
Hexachlorobutadiene	102		97		70-130	5		20
Isopropylbenzene	92		88		70-130	4		20
p-Isopropyltoluene	96		90		70-130	6		20
Naphthalene	90		93		70-130	3		20
n-Propylbenzene	95		90		70-130	5		20
1,2,3-Trichlorobenzene	101		100		70-130	1		20
1,2,4-Trichlorobenzene	101		102		70-130	1		20
1,3,5-Trimethylbenzene	96		92		70-130	4		20
1,2,4-Trimethylbenzene	95		92		70-130	3		20
Diethyl ether	94		94		70-130	0		20
Diisopropyl Ether	76		76		70-130	0		20
Ethyl-Tert-Butyl-Ether	86		88		70-130	2		20

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Volatile Organics by EPA 5035 High - Westborough Lab Associated sample(s): 01-03 Batch: WG1699160-3 WG1699160-4								
Tertiary-Amyl Methyl Ether	94		97		70-130	3		20
1,4-Dioxane	92		96		70-130	4		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	110		112		70-130
Toluene-d8	102		101		70-130
4-Bromofluorobenzene	97		96		70-130
Dibromofluoromethane	98		99		70-130

SEMIVOLATILES

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-01
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 141,8270E
 Analytical Date: 10/17/22 20:21
 Analyst: JG
 Percent Solids: 78%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 00:23

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	170	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	210	--	1
Hexachlorobenzene	ND		ug/kg	88	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	88	--	1
2-Chloronaphthalene	ND		ug/kg	210	--	1
1,2-Dichlorobenzene	ND		ug/kg	210	--	1
1,3-Dichlorobenzene	ND		ug/kg	210	--	1
1,4-Dichlorobenzene	ND		ug/kg	88	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	210	--	1
2,4-Dinitrotoluene	ND		ug/kg	88	--	1
2,6-Dinitrotoluene	ND		ug/kg	210	--	1
Azobenzene	ND		ug/kg	210	--	1
Fluoranthene	ND		ug/kg	130	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	210	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	88	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	230	--	1
Hexachlorobutadiene	ND		ug/kg	210	--	1
Hexachloroethane	ND		ug/kg	88	--	1
Isophorone	ND		ug/kg	190	--	1
Naphthalene	ND		ug/kg	210	--	1
Nitrobenzene	ND		ug/kg	190	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	210	--	1
Butyl benzyl phthalate	ND		ug/kg	210	--	1
Di-n-butylphthalate	ND		ug/kg	210	--	1
Di-n-octylphthalate	ND		ug/kg	210	--	1
Diethyl phthalate	ND		ug/kg	210	--	1
Dimethyl phthalate	ND		ug/kg	88	--	1
Benzo(a)anthracene	ND		ug/kg	130	--	1

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-01
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	170	--	1
Benzo(b)fluoranthene	ND		ug/kg	130	--	1
Benzo(k)fluoranthene	ND		ug/kg	130	--	1
Chrysene	ND		ug/kg	130	--	1
Acenaphthylene	ND		ug/kg	170	--	1
Anthracene	ND		ug/kg	130	--	1
Benzo(ghi)perylene	ND		ug/kg	170	--	1
Fluorene	ND		ug/kg	210	--	1
Phenanthrene	ND		ug/kg	130	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	88	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	170	--	1
Pyrene	ND		ug/kg	130	--	1
Aniline	ND		ug/kg	250	--	1
4-Chloroaniline	ND		ug/kg	210	--	1
Dibenzofuran	ND		ug/kg	210	--	1
2-Methylnaphthalene	ND		ug/kg	88	--	1
Acetophenone	ND		ug/kg	210	--	1
2,4,6-Trichlorophenol	ND		ug/kg	88	--	1
2-Chlorophenol	ND		ug/kg	88	--	1
2,4-Dichlorophenol	ND		ug/kg	88	--	1
2,4-Dimethylphenol	ND		ug/kg	88	--	1
2-Nitrophenol	ND		ug/kg	460	--	1
4-Nitrophenol	ND		ug/kg	300	--	1
2,4-Dinitrophenol	ND		ug/kg	1000	--	1
Pentachlorophenol	ND		ug/kg	420	--	1
Phenol	ND		ug/kg	210	--	1
2-Methylphenol	ND		ug/kg	210	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	300	--	1
2,4,5-Trichlorophenol	ND		ug/kg	210	--	1
Pyridine	ND		ug/kg	230	--	1
Biphenyl	ND		ug/kg	42	--	1

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-01
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	65		30-130
Phenol-d6	68		30-130
Nitrobenzene-d5	63		30-130
2-Fluorobiphenyl	55		30-130
2,4,6-Tribromophenol	64		30-130
4-Terphenyl-d14	47		30-130

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-02
 Client ID: S-12
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 141,8270E
 Analytical Date: 10/17/22 20:45
 Analyst: JG
 Percent Solids: 81%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 00:23

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	160	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	200	--	1
Hexachlorobenzene	ND		ug/kg	86	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	86	--	1
2-Chloronaphthalene	ND		ug/kg	200	--	1
1,2-Dichlorobenzene	ND		ug/kg	200	--	1
1,3-Dichlorobenzene	ND		ug/kg	200	--	1
1,4-Dichlorobenzene	ND		ug/kg	86	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	200	--	1
2,4-Dinitrotoluene	ND		ug/kg	86	--	1
2,6-Dinitrotoluene	ND		ug/kg	200	--	1
Azobenzene	ND		ug/kg	200	--	1
Fluoranthene	ND		ug/kg	120	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	200	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	86	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	220	--	1
Hexachlorobutadiene	ND		ug/kg	200	--	1
Hexachloroethane	ND		ug/kg	86	--	1
Isophorone	ND		ug/kg	180	--	1
Naphthalene	ND		ug/kg	200	--	1
Nitrobenzene	ND		ug/kg	180	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	200	--	1
Butyl benzyl phthalate	ND		ug/kg	200	--	1
Di-n-butylphthalate	ND		ug/kg	200	--	1
Di-n-octylphthalate	ND		ug/kg	200	--	1
Diethyl phthalate	ND		ug/kg	200	--	1
Dimethyl phthalate	ND		ug/kg	86	--	1
Benzo(a)anthracene	ND		ug/kg	120	--	1

Project Name: DUNSTABLE - GROTON**Lab Number:** L2254865**Project Number:** G-5078**Report Date:** 10/18/22**SAMPLE RESULTS**

Lab ID: L2254865-02

Date Collected: 10/04/22 14:00

Client ID: S-12

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	160	--	1
Benzo(b)fluoranthene	ND		ug/kg	120	--	1
Benzo(k)fluoranthene	ND		ug/kg	120	--	1
Chrysene	ND		ug/kg	120	--	1
Acenaphthylene	ND		ug/kg	160	--	1
Anthracene	ND		ug/kg	120	--	1
Benzo(ghi)perylene	ND		ug/kg	160	--	1
Fluorene	ND		ug/kg	200	--	1
Phenanthrene	ND		ug/kg	120	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	86	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	160	--	1
Pyrene	ND		ug/kg	120	--	1
Aniline	ND		ug/kg	240	--	1
4-Chloroaniline	ND		ug/kg	200	--	1
Dibenzofuran	ND		ug/kg	200	--	1
2-Methylnaphthalene	ND		ug/kg	86	--	1
Acetophenone	ND		ug/kg	200	--	1
2,4,6-Trichlorophenol	ND		ug/kg	86	--	1
2-Chlorophenol	ND		ug/kg	86	--	1
2,4-Dichlorophenol	ND		ug/kg	86	--	1
2,4-Dimethylphenol	ND		ug/kg	86	--	1
2-Nitrophenol	ND		ug/kg	440	--	1
4-Nitrophenol	ND		ug/kg	290	--	1
2,4-Dinitrophenol	ND		ug/kg	980	--	1
Pentachlorophenol	ND		ug/kg	410	--	1
Phenol	ND		ug/kg	200	--	1
2-Methylphenol	ND		ug/kg	200	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	290	--	1
2,4,5-Trichlorophenol	ND		ug/kg	200	--	1
Pyridine	ND		ug/kg	220	--	1
Biphenyl	ND		ug/kg	41	--	1

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-02
 Client ID: S-12
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	68		30-130
Phenol-d6	70		30-130
Nitrobenzene-d5	65		30-130
2-Fluorobiphenyl	55		30-130
2,4,6-Tribromophenol	59		30-130
4-Terphenyl-d14	28	Q	30-130

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-03
 Client ID: S-17
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 141,8270E
 Analytical Date: 10/17/22 21:09
 Analyst: JG
 Percent Solids: 86%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 00:23

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Acenaphthene	ND		ug/kg	150	--	1
1,2,4-Trichlorobenzene	ND		ug/kg	190	--	1
Hexachlorobenzene	ND		ug/kg	79	--	1
Bis(2-chloroethyl)ether	ND		ug/kg	79	--	1
2-Chloronaphthalene	ND		ug/kg	190	--	1
1,2-Dichlorobenzene	ND		ug/kg	190	--	1
1,3-Dichlorobenzene	ND		ug/kg	190	--	1
1,4-Dichlorobenzene	ND		ug/kg	79	--	1
3,3'-Dichlorobenzidine	ND		ug/kg	190	--	1
2,4-Dinitrotoluene	ND		ug/kg	79	--	1
2,6-Dinitrotoluene	ND		ug/kg	190	--	1
Azobenzene	ND		ug/kg	190	--	1
Fluoranthene	ND		ug/kg	110	--	1
4-Bromophenyl phenyl ether	ND		ug/kg	190	--	1
Bis(2-chloroisopropyl)ether	ND		ug/kg	79	--	1
Bis(2-chloroethoxy)methane	ND		ug/kg	200	--	1
Hexachlorobutadiene	ND		ug/kg	190	--	1
Hexachloroethane	ND		ug/kg	79	--	1
Isophorone	ND		ug/kg	170	--	1
Naphthalene	ND		ug/kg	190	--	1
Nitrobenzene	ND		ug/kg	170	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/kg	190	--	1
Butyl benzyl phthalate	ND		ug/kg	190	--	1
Di-n-butylphthalate	ND		ug/kg	190	--	1
Di-n-octylphthalate	ND		ug/kg	190	--	1
Diethyl phthalate	ND		ug/kg	190	--	1
Dimethyl phthalate	ND		ug/kg	79	--	1
Benzo(a)anthracene	ND		ug/kg	110	--	1

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-03
 Client ID: S-17
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						
Benzo(a)pyrene	ND		ug/kg	150	--	1
Benzo(b)fluoranthene	ND		ug/kg	110	--	1
Benzo(k)fluoranthene	ND		ug/kg	110	--	1
Chrysene	ND		ug/kg	110	--	1
Acenaphthylene	ND		ug/kg	150	--	1
Anthracene	ND		ug/kg	110	--	1
Benzo(ghi)perylene	ND		ug/kg	150	--	1
Fluorene	ND		ug/kg	190	--	1
Phenanthrene	ND		ug/kg	110	--	1
Dibenzo(a,h)anthracene	ND		ug/kg	79	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/kg	150	--	1
Pyrene	ND		ug/kg	110	--	1
Aniline	ND		ug/kg	220	--	1
4-Chloroaniline	ND		ug/kg	190	--	1
Dibenzofuran	ND		ug/kg	190	--	1
2-Methylnaphthalene	ND		ug/kg	79	--	1
Acetophenone	ND		ug/kg	190	--	1
2,4,6-Trichlorophenol	ND		ug/kg	79	--	1
2-Chlorophenol	ND		ug/kg	79	--	1
2,4-Dichlorophenol	ND		ug/kg	79	--	1
2,4-Dimethylphenol	ND		ug/kg	79	--	1
2-Nitrophenol	ND		ug/kg	410	--	1
4-Nitrophenol	ND		ug/kg	260	--	1
2,4-Dinitrophenol	ND		ug/kg	900	--	1
Pentachlorophenol	ND		ug/kg	380	--	1
Phenol	ND		ug/kg	190	--	1
2-Methylphenol	ND		ug/kg	190	--	1
3-Methylphenol/4-Methylphenol	ND		ug/kg	270	--	1
2,4,5-Trichlorophenol	ND		ug/kg	190	--	1
Pyridine	ND		ug/kg	200	--	1
Biphenyl	ND		ug/kg	38	--	1

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-03
 Client ID: S-17
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
MCP Semivolatile Organics - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	67		30-130
Phenol-d6	69		30-130
Nitrobenzene-d5	56		30-130
2-Fluorobiphenyl	55		30-130
2,4,6-Tribromophenol	64		30-130
4-Terphenyl-d14	43		30-130

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 10/16/22 18:14
Analyst: CMM

Extraction Method: EPA 3546
Extraction Date: 10/15/22 16:19

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-03 Batch: WG1699906-1					
Acenaphthene	ND		ug/kg	130	--
1,2,4-Trichlorobenzene	ND		ug/kg	160	--
Hexachlorobenzene	ND		ug/kg	69	--
Bis(2-chloroethyl)ether	ND		ug/kg	69	--
2-Chloronaphthalene	ND		ug/kg	160	--
1,2-Dichlorobenzene	ND		ug/kg	160	--
1,3-Dichlorobenzene	ND		ug/kg	160	--
1,4-Dichlorobenzene	ND		ug/kg	69	--
3,3'-Dichlorobenzidine	ND		ug/kg	160	--
2,4-Dinitrotoluene	ND		ug/kg	69	--
2,6-Dinitrotoluene	ND		ug/kg	160	--
Azobenzene	ND		ug/kg	160	--
Fluoranthene	ND		ug/kg	98	--
4-Bromophenyl phenyl ether	ND		ug/kg	160	--
Bis(2-chloroisopropyl)ether	ND		ug/kg	69	--
Bis(2-chloroethoxy)methane	ND		ug/kg	180	--
Hexachlorobutadiene	ND		ug/kg	160	--
Hexachloroethane	ND		ug/kg	69	--
Isophorone	ND		ug/kg	150	--
Naphthalene	ND		ug/kg	160	--
Nitrobenzene	ND		ug/kg	150	--
Bis(2-ethylhexyl)phthalate	ND		ug/kg	160	--
Butyl benzyl phthalate	ND		ug/kg	160	--
Di-n-butylphthalate	ND		ug/kg	160	--
Di-n-octylphthalate	ND		ug/kg	160	--
Diethyl phthalate	ND		ug/kg	160	--
Dimethyl phthalate	ND		ug/kg	69	--
Benzo(a)anthracene	ND		ug/kg	98	--
Benzo(a)pyrene	ND		ug/kg	130	--

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 141,8270E
Analytical Date: 10/16/22 18:14
Analyst: CMM

Extraction Method: EPA 3546
Extraction Date: 10/15/22 16:19

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-03 Batch: WG1699906-1					
Benzo(b)fluoranthene	ND		ug/kg	98	--
Benzo(k)fluoranthene	ND		ug/kg	98	--
Chrysene	ND		ug/kg	98	--
Acenaphthylene	ND		ug/kg	130	--
Anthracene	ND		ug/kg	98	--
Benzo(ghi)perylene	ND		ug/kg	130	--
Fluorene	ND		ug/kg	160	--
Phenanthrene	ND		ug/kg	98	--
Dibenzo(a,h)anthracene	ND		ug/kg	69	--
Indeno(1,2,3-cd)pyrene	ND		ug/kg	130	--
Pyrene	ND		ug/kg	98	--
Aniline	ND		ug/kg	200	--
4-Chloroaniline	ND		ug/kg	160	--
Dibenzofuran	ND		ug/kg	160	--
2-Methylnaphthalene	ND		ug/kg	69	--
Acetophenone	ND		ug/kg	160	--
2,4,6-Trichlorophenol	ND		ug/kg	69	--
2-Chlorophenol	ND		ug/kg	69	--
2,4-Dichlorophenol	ND		ug/kg	69	--
2,4-Dimethylphenol	ND		ug/kg	69	--
2-Nitrophenol	ND		ug/kg	350	--
4-Nitrophenol	ND		ug/kg	230	--
2,4-Dinitrophenol	ND		ug/kg	780	--
Pentachlorophenol	ND		ug/kg	330	--
Phenol	ND		ug/kg	160	--
2-Methylphenol	ND		ug/kg	160	--
3-Methylphenol/4-Methylphenol	ND		ug/kg	240	--
2,4,5-Trichlorophenol	ND		ug/kg	160	--
Pyridine	ND		ug/kg	180	--

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 141,8270E
Analytical Date: 10/16/22 18:14
Analyst: CMM

Extraction Method: EPA 3546
Extraction Date: 10/15/22 16:19

Parameter	Result	Qualifier	Units	RL	MDL
MCP Semivolatile Organics - Westborough Lab for sample(s): 01-03 Batch: WG1699906-1					
Biphenyl	ND		ug/kg	33	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	90		30-130
Phenol-d6	88		30-130
Nitrobenzene-d5	97		30-130
2-Fluorobiphenyl	83		30-130
2,4,6-Tribromophenol	110		30-130
4-Terphenyl-d14	85		30-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-03 Batch: WG1699906-2 WG1699906-3								
Acenaphthene	77		79		40-140	3		30
1,2,4-Trichlorobenzene	85		89		40-140	5		30
Hexachlorobenzene	90		95		40-140	5		30
Bis(2-chloroethyl)ether	78		79		40-140	1		30
2-Chloronaphthalene	83		88		40-140	6		30
1,2-Dichlorobenzene	78		81		40-140	4		30
1,3-Dichlorobenzene	76		78		40-140	3		30
1,4-Dichlorobenzene	78		80		40-140	3		30
3,3'-Dichlorobenzidine	78		80		40-140	3		30
2,4-Dinitrotoluene	101		105		40-140	4		30
2,6-Dinitrotoluene	99		105		40-140	6		30
Azobenzene	84		87		40-140	4		30
Fluoranthene	82		88		40-140	7		30
4-Bromophenyl phenyl ether	89		95		40-140	7		30
Bis(2-chloroisopropyl)ether	58		62		40-140	7		30
Bis(2-chloroethoxy)methane	82		85		40-140	4		30
Hexachlorobutadiene	90		95		40-140	5		30
Hexachloroethane	85		88		40-140	3		30
Isophorone	82		84		40-140	2		30
Naphthalene	78		83		40-140	6		30
Nitrobenzene	94		98		40-140	4		30
Bis(2-ethylhexyl)phthalate	85		89		40-140	5		30
Butyl benzyl phthalate	88		97		40-140	10		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

Parameter	LCS		LCSD		%Recovery Limits	RPD	Qual	RPD Limits
	%Recovery	Qual	%Recovery	Qual				
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-03 Batch: WG1699906-2 WG1699906-3								
Di-n-butylphthalate	84		90		40-140	7		30
Di-n-octylphthalate	85		90		40-140	6		30
Diethyl phthalate	88		92		40-140	4		30
Dimethyl phthalate	87		92		40-140	6		30
Benzo(a)anthracene	81		85		40-140	5		30
Benzo(a)pyrene	95		103		40-140	8		30
Benzo(b)fluoranthene	91		97		40-140	6		30
Benzo(k)fluoranthene	82		88		40-140	7		30
Chrysene	81		85		40-140	5		30
Acenaphthylene	88		94		40-140	7		30
Anthracene	79		83		40-140	5		30
Benzo(ghi)perylene	83		89		40-140	7		30
Fluorene	82		86		40-140	5		30
Phenanthrene	77		80		40-140	4		30
Dibenzo(a,h)anthracene	86		90		40-140	5		30
Indeno(1,2,3-cd)pyrene	95		96		40-140	1		30
Pyrene	82		89		40-140	8		30
Aniline	68		68		40-140	0		30
4-Chloroaniline	91		92		40-140	1		30
Dibenzofuran	81		85		40-140	5		30
2-Methylnaphthalene	77		81		40-140	5		30
Acetophenone	83		86		40-140	4		30
2,4,6-Trichlorophenol	102		107		30-130	5		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

Parameter	LCS		LCSD		%Recovery Limits	RPD	RPD	
	%Recovery	Qual	%Recovery	Qual			Qual	Limits
MCP Semivolatile Organics - Westborough Lab Associated sample(s): 01-03 Batch: WG1699906-2 WG1699906-3								
2-Chlorophenol	87		88		30-130	1		30
2,4-Dichlorophenol	92		95		30-130	3		30
2,4-Dimethylphenol	90		92		30-130	2		30
2-Nitrophenol	105		108		30-130	3		30
4-Nitrophenol	114		124		30-130	8		30
2,4-Dinitrophenol	110		108		30-130	2		30
Pentachlorophenol	98		101		30-130	3		30
Phenol	89		92		30-130	3		30
2-Methylphenol	87		91		30-130	4		30
3-Methylphenol/4-Methylphenol	99		100		30-130	1		30
2,4,5-Trichlorophenol	102		110		30-130	8		30
Pyridine	63		64		30-130	2		30
Biphenyl	77		82		40-140	6		30

Surrogate	LCS		LCSD		Acceptance Criteria
	%Recovery	Qual	%Recovery	Qual	
2-Fluorophenol	95		99		30-130
Phenol-d6	96		98		30-130
Nitrobenzene-d5	108		107		30-130
2-Fluorobiphenyl	86		91		30-130
2,4,6-Tribromophenol	121		126		30-130
4-Terphenyl-d14	87		94		30-130

PETROLEUM HYDROCARBONS

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-01
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 1,8015D(M)
 Analytical Date: 10/16/22 15:46
 Analyst: SC
 Percent Solids: 78%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 03:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	148000		ug/kg	41600	--	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
o-Terphenyl			70		40-140	

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-02
 Client ID: S-12
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 1,8015D(M)
 Analytical Date: 10/16/22 14:02
 Analyst: SC
 Percent Solids: 81%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 03:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	87900		ug/kg	39500	--	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
o-Terphenyl			59		40-140	

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-03
 Client ID: S-17
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 1,8015D(M)
 Analytical Date: 10/16/22 14:37
 Analyst: SC
 Percent Solids: 86%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 03:17

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Petroleum Hydrocarbon Quantitation - Westborough Lab						
TPH (C10-C36)	106000		ug/kg	36900	--	1
Surrogate			% Recovery	Qualifier	Acceptance Criteria	
o-Terphenyl			66		40-140	

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8015D(M)
Analytical Date: 10/17/22 13:08
Analyst: SC

Extraction Method: EPA 3546
Extraction Date: 10/16/22 03:17

Parameter	Result	Qualifier	Units	RL	MDL
Petroleum Hydrocarbon Quantitation - Westborough Lab for sample(s): 01-03 Batch: WG1699966-1					
TPH (C10-C36)	ND		ug/kg	31900	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
o-Terphenyl	66		40-140

Lab Control Sample Analysis Batch Quality Control

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Petroleum Hydrocarbon Quantitation - Westborough Lab Associated sample(s): 01-03 Batch: WG1699966-2								
TPH (C10-C36)	107		-		40-140	-		40

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
o-Terphenyl	68				40-140

PCBS

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-01
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 97,8082A
 Analytical Date: 10/18/22 16:18
 Analyst: MEO
 Percent Solids: 78%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 08:18
 Cleanup Method: EPA 3665A
 Cleanup Date: 10/16/22
 Cleanup Method: EPA 3660B
 Cleanup Date: 10/16/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	40.1	--	1	A
Aroclor 1221	ND		ug/kg	40.1	--	1	A
Aroclor 1232	ND		ug/kg	40.1	--	1	A
Aroclor 1242	ND		ug/kg	40.1	--	1	A
Aroclor 1248	ND		ug/kg	40.1	--	1	A
Aroclor 1254	ND		ug/kg	40.1	--	1	A
Aroclor 1260	ND		ug/kg	40.1	--	1	A
Aroclor 1262	ND		ug/kg	40.1	--	1	A
Aroclor 1268	ND		ug/kg	40.1	--	1	A
PCBs, Total	ND		ug/kg	40.1	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	71		30-150	B
Decachlorobiphenyl	70		30-150	B
2,4,5,6-Tetrachloro-m-xylene	57		30-150	A
Decachlorobiphenyl	49		30-150	A

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-02
 Client ID: S-12
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 97,8082A
 Analytical Date: 10/18/22 00:51
 Analyst: MEO
 Percent Solids: 81%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 08:18
 Cleanup Method: EPA 3665A
 Cleanup Date: 10/16/22
 Cleanup Method: EPA 3660B
 Cleanup Date: 10/17/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	40.4	--	1	A
Aroclor 1221	ND		ug/kg	40.4	--	1	A
Aroclor 1232	ND		ug/kg	40.4	--	1	A
Aroclor 1242	ND		ug/kg	40.4	--	1	A
Aroclor 1248	ND		ug/kg	40.4	--	1	A
Aroclor 1254	ND		ug/kg	40.4	--	1	A
Aroclor 1260	ND		ug/kg	40.4	--	1	A
Aroclor 1262	ND		ug/kg	40.4	--	1	A
Aroclor 1268	ND		ug/kg	40.4	--	1	A
PCBs, Total	ND		ug/kg	40.4	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	52		30-150	B
Decachlorobiphenyl	44		30-150	B
2,4,5,6-Tetrachloro-m-xylene	47		30-150	A
Decachlorobiphenyl	40		30-150	A

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-03
 Client ID: S-17
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 97,8082A
 Analytical Date: 10/17/22 15:31
 Analyst: MEO
 Percent Solids: 86%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 08:18
 Cleanup Method: EPA 3665A
 Cleanup Date: 10/17/22
 Cleanup Method: EPA 3660B
 Cleanup Date: 10/17/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Polychlorinated Biphenyls - Westborough Lab							
Aroclor 1016	ND		ug/kg	36.8	--	1	A
Aroclor 1221	ND		ug/kg	36.8	--	1	A
Aroclor 1232	ND		ug/kg	36.8	--	1	A
Aroclor 1242	ND		ug/kg	36.8	--	1	A
Aroclor 1248	ND		ug/kg	36.8	--	1	A
Aroclor 1254	ND		ug/kg	36.8	--	1	A
Aroclor 1260	ND		ug/kg	36.8	--	1	A
Aroclor 1262	ND		ug/kg	36.8	--	1	A
Aroclor 1268	ND		ug/kg	36.8	--	1	A
PCBs, Total	ND		ug/kg	36.8	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	59		30-150	B
Decachlorobiphenyl	75		30-150	B
2,4,5,6-Tetrachloro-m-xylene	57		30-150	A
Decachlorobiphenyl	61		30-150	A

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 97,8082A
Analytical Date: 10/17/22 10:22
Analyst: RMP

Extraction Method: EPA 3546
Extraction Date: 10/15/22 09:11
Cleanup Method: EPA 3665A
Cleanup Date: 10/16/22
Cleanup Method: EPA 3660B
Cleanup Date: 10/16/22

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Polychlorinated Biphenyls - Westborough Lab for sample(s): 01-03 Batch: WG1699832-1						
Aroclor 1016	ND		ug/kg	32.3	--	A
Aroclor 1221	ND		ug/kg	32.3	--	A
Aroclor 1232	ND		ug/kg	32.3	--	A
Aroclor 1242	ND		ug/kg	32.3	--	A
Aroclor 1248	ND		ug/kg	32.3	--	A
Aroclor 1254	ND		ug/kg	32.3	--	A
Aroclor 1260	ND		ug/kg	32.3	--	A
Aroclor 1262	ND		ug/kg	32.3	--	A
Aroclor 1268	ND		ug/kg	32.3	--	A
PCBs, Total	ND		ug/kg	32.3	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		30-150	B
Decachlorobiphenyl	62		30-150	B
2,4,5,6-Tetrachloro-m-xylene	63		30-150	A
Decachlorobiphenyl	58		30-150	A

Lab Control Sample Analysis Batch Quality Control

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Polychlorinated Biphenyls - Westborough Lab Associated sample(s): 01-03 Batch: WG1699832-2 WG1699832-3									
Aroclor 1016	61		59		40-140	3		30	A
Aroclor 1260	49		49		40-140	0		30	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	71		66		30-150	B
Decachlorobiphenyl	65		61		30-150	B
2,4,5,6-Tetrachloro-m-xylene	68		64		30-150	A
Decachlorobiphenyl	63		58		30-150	A

PESTICIDES

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-01
 Client ID: S-5
 Sample Location: GROTON, MA

Date Collected: 10/04/22 12:15
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 97,8081B
 Analytical Date: 10/17/22 16:41
 Analyst: AR
 Percent Solids: 78%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 00:18
 Cleanup Method: EPA 3620B
 Cleanup Date: 10/17/22
 Cleanup Method: EPA 3660B
 Cleanup Date: 10/17/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Organochlorine Pesticides - Westborough Lab							
Delta-BHC	ND		ug/kg	1.97	--	1	A
Lindane	ND		ug/kg	0.658	--	1	A
Alpha-BHC	ND		ug/kg	0.823	--	1	A
Beta-BHC	ND		ug/kg	1.97	--	1	A
Heptachlor	ND		ug/kg	0.987	--	1	A
Aldrin	ND		ug/kg	1.97	--	1	A
Heptachlor epoxide	ND		ug/kg	3.70	--	1	A
Endrin	ND		ug/kg	0.823	--	1	A
Endrin ketone	ND		ug/kg	1.97	--	1	A
Dieldrin	ND		ug/kg	1.23	--	1	A
4,4'-DDE	ND	IP	ug/kg	1.97	--	1	B
4,4'-DDD	ND		ug/kg	1.97	--	1	A
4,4'-DDT	ND		ug/kg	3.70	--	1	A
Endosulfan I	ND		ug/kg	1.97	--	1	A
Endosulfan II	ND		ug/kg	1.97	--	1	A
Endosulfan sulfate	ND		ug/kg	0.823	--	1	A
Methoxychlor	ND		ug/kg	3.70	--	1	A
Chlordane	ND		ug/kg	16.4	--	1	A
Hexachlorobenzene	ND		ug/kg	1.97	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	83		30-150	A
Decachlorobiphenyl	84		30-150	A
2,4,5,6-Tetrachloro-m-xylene	85		30-150	B
Decachlorobiphenyl	78		30-150	B

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-02
 Client ID: S-12
 Sample Location: GROTON, MA

Date Collected: 10/04/22 14:00
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 97,8081B
 Analytical Date: 10/17/22 16:53
 Analyst: AR
 Percent Solids: 81%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 00:18
 Cleanup Method: EPA 3620B
 Cleanup Date: 10/17/22
 Cleanup Method: EPA 3660B
 Cleanup Date: 10/17/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Organochlorine Pesticides - Westborough Lab							
Delta-BHC	ND		ug/kg	1.97	--	1	A
Lindane	ND		ug/kg	0.658	--	1	A
Alpha-BHC	ND		ug/kg	0.823	--	1	A
Beta-BHC	ND		ug/kg	1.97	--	1	A
Heptachlor	ND		ug/kg	0.987	--	1	A
Aldrin	ND		ug/kg	1.97	--	1	A
Heptachlor epoxide	ND		ug/kg	3.70	--	1	A
Endrin	ND		ug/kg	0.823	--	1	A
Endrin ketone	ND		ug/kg	1.97	--	1	A
Dieldrin	ND		ug/kg	1.23	--	1	A
4,4'-DDE	ND		ug/kg	1.97	--	1	B
4,4'-DDD	ND		ug/kg	1.97	--	1	A
4,4'-DDT	ND		ug/kg	3.70	--	1	A
Endosulfan I	ND		ug/kg	1.97	--	1	A
Endosulfan II	ND		ug/kg	1.97	--	1	A
Endosulfan sulfate	ND		ug/kg	0.823	--	1	A
Methoxychlor	ND		ug/kg	3.70	--	1	A
Chlordane	ND		ug/kg	16.4	--	1	A
Hexachlorobenzene	ND		ug/kg	1.97	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74		30-150	A
Decachlorobiphenyl	77		30-150	A
2,4,5,6-Tetrachloro-m-xylene	81		30-150	B
Decachlorobiphenyl	73		30-150	B

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-03
 Client ID: S-17
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:

Matrix: Soil
 Analytical Method: 97,8081B
 Analytical Date: 10/17/22 17:04
 Analyst: AR
 Percent Solids: 86%

Extraction Method: EPA 3546
 Extraction Date: 10/16/22 00:18
 Cleanup Method: EPA 3620B
 Cleanup Date: 10/17/22
 Cleanup Method: EPA 3660B
 Cleanup Date: 10/17/22

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
MCP Organochlorine Pesticides - Westborough Lab							
Delta-BHC	ND		ug/kg	1.79	--	1	A
Lindane	ND		ug/kg	0.597	--	1	A
Alpha-BHC	ND		ug/kg	0.747	--	1	A
Beta-BHC	ND		ug/kg	1.79	--	1	A
Heptachlor	ND		ug/kg	0.896	--	1	A
Aldrin	ND		ug/kg	1.79	--	1	A
Heptachlor epoxide	ND		ug/kg	3.36	--	1	A
Endrin	ND		ug/kg	0.747	--	1	A
Endrin ketone	ND		ug/kg	1.79	--	1	A
Dieldrin	ND		ug/kg	1.12	--	1	A
4,4'-DDE	ND	IP	ug/kg	1.79	--	1	B
4,4'-DDD	ND		ug/kg	1.79	--	1	A
4,4'-DDT	ND		ug/kg	3.36	--	1	A
Endosulfan I	ND		ug/kg	1.79	--	1	A
Endosulfan II	ND		ug/kg	1.79	--	1	A
Endosulfan sulfate	ND		ug/kg	0.747	--	1	A
Methoxychlor	ND		ug/kg	3.36	--	1	A
Chlordane	ND		ug/kg	14.9	--	1	A
Hexachlorobenzene	ND		ug/kg	1.79	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	87		30-150	A
Decachlorobiphenyl	86		30-150	A
2,4,5,6-Tetrachloro-m-xylene	93		30-150	B
Decachlorobiphenyl	79		30-150	B

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 97,8081B
Analytical Date: 10/17/22 11:06
Analyst: MMG

Extraction Method: EPA 3546
Extraction Date: 10/15/22 23:46
Cleanup Method: EPA 3620B
Cleanup Date: 10/17/22
Cleanup Method: EPA 3660B
Cleanup Date: 10/17/22

Parameter	Result	Qualifier	Units	RL	MDL	Column
MCP Organochlorine Pesticides - Westborough Lab for sample(s): 01-03 Batch: WG1699953-1						
Delta-BHC	ND		ug/kg	1.54	--	A
Lindane	ND		ug/kg	0.515	--	A
Alpha-BHC	ND		ug/kg	0.644	--	A
Beta-BHC	ND		ug/kg	1.54	--	A
Heptachlor	ND		ug/kg	0.772	--	A
Aldrin	ND		ug/kg	1.54	--	A
Heptachlor epoxide	ND		ug/kg	2.90	--	A
Endrin	ND		ug/kg	0.644	--	A
Endrin ketone	ND		ug/kg	1.54	--	A
Dieldrin	ND		ug/kg	0.965	--	A
4,4'-DDE	ND		ug/kg	1.54	--	A
4,4'-DDD	ND		ug/kg	1.54	--	A
4,4'-DDT	ND		ug/kg	2.90	--	A
Endosulfan I	ND		ug/kg	1.54	--	A
Endosulfan II	ND		ug/kg	1.54	--	A
Endosulfan sulfate	ND		ug/kg	0.644	--	A
Methoxychlor	ND		ug/kg	2.90	--	A
Chlordane	ND		ug/kg	12.9	--	A
Hexachlorobenzene	ND		ug/kg	1.54	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	75		30-150	A
Decachlorobiphenyl	91		30-150	A
2,4,5,6-Tetrachloro-m-xylene	73		30-150	B
Decachlorobiphenyl	82		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01-03 Batch: WG1699953-2 WG1699953-3									
Delta-BHC	79		77		40-140	3		30	A
Lindane	94		93		40-140	1		30	A
Alpha-BHC	97		96		40-140	1		30	A
Beta-BHC	100		98		40-140	2		30	A
Heptachlor	96		96		40-140	0		30	A
Aldrin	99		99		40-140	0		30	A
Heptachlor epoxide	97		96		40-140	1		30	A
Endrin	105		104		40-140	1		30	A
Endrin ketone	102		100		40-140	2		30	A
Dieldrin	107		106		40-140	1		30	A
4,4'-DDE	107		106		40-140	1		30	A
4,4'-DDD	113		112		40-140	1		30	A
4,4'-DDT	111		109		40-140	2		30	A
Endosulfan I	100		98		40-140	2		30	A
Endosulfan II	106		104		40-140	2		30	A
Endosulfan sulfate	86		85		40-140	1		30	A
Methoxychlor	102		100		40-140	2		30	A
Hexachlorobenzene	88		87		40-140	1		30	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Parameter	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>%Recovery</i> Limits	<i>RPD</i>	<i>Qual</i>	<i>RPD</i> Limits
MCP Organochlorine Pesticides - Westborough Lab Associated sample(s): 01-03 Batch: WG1699953-2 WG1699953-3								

<i>Surrogate</i>	<i>LCS</i> %Recovery	<i>Qual</i>	<i>LCSD</i> %Recovery	<i>Qual</i>	<i>Acceptance</i> Criteria	<i>Column</i>
2,4,5,6-Tetrachloro-m-xylene	77		77		30-150	A
Decachlorobiphenyl	95		92		30-150	A
2,4,5,6-Tetrachloro-m-xylene	77		76		30-150	B
Decachlorobiphenyl	84		84		30-150	B

METALS

Project Name: DUNSTABLE - GROTON**Lab Number:** L2254865**Project Number:** G-5078**Report Date:** 10/18/22**SAMPLE RESULTS**

Lab ID: L2254865-01

Date Collected: 10/04/22 12:15

Client ID: S-5

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 78%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	8.42		mg/kg	0.479	--	1	10/05/22 08:00	10/07/22 17:10	EPA 3050B	97,6010D	JF
Barium, Total	12.2		mg/kg	0.479	--	1	10/05/22 08:00	10/07/22 17:10	EPA 3050B	97,6010D	JF
Cadmium, Total	ND		mg/kg	0.479	--	1	10/05/22 08:00	10/07/22 17:10	EPA 3050B	97,6010D	JF
Chromium, Total	9.64		mg/kg	0.479	--	1	10/05/22 08:00	10/07/22 17:10	EPA 3050B	97,6010D	JF
Lead, Total	10.9		mg/kg	2.40	--	1	10/05/22 08:00	10/07/22 17:10	EPA 3050B	97,6010D	JF
Mercury, Total	ND		mg/kg	0.088	--	1	10/05/22 08:43	10/05/22 19:47	EPA 7471B	97,7471B	ZK
Selenium, Total	ND		mg/kg	2.40	--	1	10/05/22 08:00	10/07/22 17:10	EPA 3050B	97,6010D	JF
Silver, Total	ND		mg/kg	0.479	--	1	10/05/22 08:00	10/07/22 17:10	EPA 3050B	97,6010D	JF



Project Name: DUNSTABLE - GROTON**Lab Number:** L2254865**Project Number:** G-5078**Report Date:** 10/18/22**SAMPLE RESULTS**

Lab ID: L2254865-02

Date Collected: 10/04/22 14:00

Client ID: S-12

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Percent Solids: 81%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	10.8		mg/kg	0.475	--	1	10/05/22 08:00	10/07/22 17:15	EPA 3050B	97,6010D	JF
Barium, Total	14.5		mg/kg	0.475	--	1	10/05/22 08:00	10/07/22 17:15	EPA 3050B	97,6010D	JF
Cadmium, Total	ND		mg/kg	0.475	--	1	10/05/22 08:00	10/07/22 17:15	EPA 3050B	97,6010D	JF
Chromium, Total	11.7		mg/kg	0.475	--	1	10/05/22 08:00	10/07/22 17:15	EPA 3050B	97,6010D	JF
Lead, Total	12.8		mg/kg	2.38	--	1	10/05/22 08:00	10/07/22 17:15	EPA 3050B	97,6010D	JF
Mercury, Total	ND		mg/kg	0.095	--	1	10/05/22 08:43	10/05/22 19:50	EPA 7471B	97,7471B	ZK
Selenium, Total	ND		mg/kg	2.38	--	1	10/05/22 08:00	10/07/22 17:15	EPA 3050B	97,6010D	JF
Silver, Total	ND		mg/kg	0.475	--	1	10/05/22 08:00	10/07/22 17:15	EPA 3050B	97,6010D	JF



Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-03
 Client ID: S-17
 Sample Location: GROTON, MA

Date Collected: 10/04/22 15:35
 Date Received: 10/04/22
 Field Prep: Not Specified

Sample Depth:
 Matrix: Soil
 Percent Solids: 86%

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab											
Arsenic, Total	10.2		mg/kg	0.445	--	1	10/05/22 08:00	10/07/22 17:19	EPA 3050B	97,6010D	JF
Barium, Total	14.8		mg/kg	0.445	--	1	10/05/22 08:00	10/07/22 17:19	EPA 3050B	97,6010D	JF
Cadmium, Total	ND		mg/kg	0.445	--	1	10/05/22 08:00	10/07/22 17:19	EPA 3050B	97,6010D	JF
Chromium, Total	12.2		mg/kg	0.445	--	1	10/05/22 08:00	10/07/22 17:19	EPA 3050B	97,6010D	JF
Lead, Total	11.7		mg/kg	2.22	--	1	10/05/22 08:00	10/07/22 17:19	EPA 3050B	97,6010D	JF
Mercury, Total	ND		mg/kg	0.087	--	1	10/05/22 08:43	10/05/22 19:54	EPA 7471B	97,7471B	ZK
Selenium, Total	ND		mg/kg	2.22	--	1	10/05/22 08:00	10/07/22 17:19	EPA 3050B	97,6010D	JF
Silver, Total	ND		mg/kg	0.445	--	1	10/05/22 08:00	10/07/22 17:19	EPA 3050B	97,6010D	JF



Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Method Blank Analysis Batch Quality Control

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1695599-1									
Mercury, Total	ND	mg/kg	0.083	--	1	10/05/22 08:43	10/05/22 18:48	97,7471B	ZK

Prep Information

Digestion Method: EPA 7471B

Parameter	Result Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
MCP Total Metals - Mansfield Lab for sample(s): 01-03 Batch: WG1695601-1									
Arsenic, Total	ND	mg/kg	0.400	--	1	10/05/22 08:00	10/07/22 15:45	97,6010D	JF
Barium, Total	ND	mg/kg	0.400	--	1	10/05/22 08:00	10/07/22 15:45	97,6010D	JF
Cadmium, Total	ND	mg/kg	0.400	--	1	10/05/22 08:00	10/07/22 15:45	97,6010D	JF
Chromium, Total	ND	mg/kg	0.400	--	1	10/05/22 08:00	10/07/22 15:45	97,6010D	JF
Lead, Total	ND	mg/kg	2.00	--	1	10/05/22 08:00	10/07/22 15:45	97,6010D	JF
Selenium, Total	ND	mg/kg	2.00	--	1	10/05/22 08:00	10/07/22 15:45	97,6010D	JF
Silver, Total	ND	mg/kg	0.400	--	1	10/05/22 08:00	10/07/22 15:45	97,6010D	JF

Prep Information

Digestion Method: EPA 3050B

Lab Control Sample Analysis

Batch Quality Control

Project Name: DUNSTABLE - GROTON

Project Number: G-5078

Lab Number: L2254865

Report Date: 10/18/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
MCP Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1695599-2 WG1695599-3 SRM Lot Number: D113-540								
Mercury, Total	101		102		60-140	1		30
MCP Total Metals - Mansfield Lab Associated sample(s): 01-03 Batch: WG1695601-2 WG1695601-3 SRM Lot Number: D113-540								
Arsenic, Total	102		97		70-130	5		30
Barium, Total	88		84		75-125	5		30
Cadmium, Total	99		93		75-125	6		30
Chromium, Total	92		85		70-130	8		30
Lead, Total	100		94		72-128	6		30
Selenium, Total	104		99		66-134	5		30
Silver, Total	93		87		70-131	7		30

INORGANICS & MISCELLANEOUS

Project Name: DUNSTABLE - GROTON**Lab Number:** L2254865**Project Number:** G-5078**Report Date:** 10/18/22**SAMPLE RESULTS**

Lab ID: L2254865-01

Date Collected: 10/04/22 12:15

Client ID: S-5

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	44		umhos/cm	10	--	1	-	10/06/22 17:21	1,9050A	NA
Solids, Total	78.4		%	0.100	NA	1	-	10/05/22 11:32	121,2540G	RI



Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-02
Client ID: S-12
Sample Location: GROTON, MA

Date Collected: 10/04/22 14:00
Date Received: 10/04/22
Field Prep: Not Specified

Sample Depth:
Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	34		umhos/cm	10	--	1	-	10/06/22 17:21	1,9050A	NA
Solids, Total	80.6		%	0.100	NA	1	-	10/05/22 11:32	121,2540G	RI



Project Name: DUNSTABLE - GROTON

Lab Number: L2254865

Project Number: G-5078

Report Date: 10/18/22

SAMPLE RESULTS

Lab ID: L2254865-03

Date Collected: 10/04/22 15:35

Client ID: S-17

Date Received: 10/04/22

Sample Location: GROTON, MA

Field Prep: Not Specified

Sample Depth:

Matrix: Soil

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Specific Conductance @ 25 C	22		umhos/cm	10	--	1	-	10/06/22 17:21	1,9050A	NA
Solids, Total	86.3		%	0.100	NA	1	-	10/05/22 11:32	121,2540G	RI



Lab Control Sample Analysis Batch Quality Control

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-03 Batch: WG1696272-1								
Specific Conductance	99		-		99-101	-		

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Serial_No:10182217:27
Lab Number: L2254865
Report Date: 10/18/22

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler **Custody Seal**
 B Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2254865-01A	Vial MeOH preserved	B	NA		5.2	Y	Absent		MCP-8260H-21(14)
L2254865-01B	Metals Only-Glass 60mL/2oz unpreserved	B	NA		5.2	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L2254865-01C	Plastic 2oz unpreserved for TS	B	NA		5.2	Y	Absent		TS(7)
L2254865-01D	Glass 500ml/16oz unpreserved	B	NA		5.2	Y	Absent		MCP-8082-10(365),MCP-8081-10(14),MCP-8270-21(14),TPH-DRO-D(14),COND-9050(28)
L2254865-02A	Vial MeOH preserved	B	NA		5.2	Y	Absent		MCP-8260H-21(14)
L2254865-02B	Metals Only-Glass 60mL/2oz unpreserved	B	NA		5.2	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-7471T-10(28),MCP-CD-6010T-10(180),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L2254865-02C	Plastic 2oz unpreserved for TS	B	NA		5.2	Y	Absent		TS(7)
L2254865-02D	Glass 500ml/16oz unpreserved	B	NA		5.2	Y	Absent		MCP-8082-10(365),MCP-8081-10(14),MCP-8270-21(14),TPH-DRO-D(14),COND-9050(28)
L2254865-03A	Vial MeOH preserved	B	NA		5.2	Y	Absent		MCP-8260H-21(14)
L2254865-03B	Metals Only-Glass 60mL/2oz unpreserved	B	NA		5.2	Y	Absent		MCP-CR-6010T-10(180),MCP-AS-6010T-10(180),MCP-CD-6010T-10(180),MCP-7471T-10(28),MCP-AG-6010T-10(180),MCP-SE-6010T-10(180),MCP-BA-6010T-10(180),MCP-PB-6010T-10(180)
L2254865-03C	Plastic 2oz unpreserved for TS	B	NA		5.2	Y	Absent		TS(7)
L2254865-03D	Glass 500ml/16oz unpreserved	B	NA		5.2	Y	Absent		MCP-8082-10(365),MCP-8081-10(14),MCP-8270-21(14),TPH-DRO-D(14),COND-9050(28)

*Values in parentheses indicate holding time in days



Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
NR	- No Results: Term is utilized when 'No Target Compounds Requested' is reported for the analysis of Volatile or Semivolatile Organic TIC only requests.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Report Format: Data Usability Report



Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Footnotes

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Chlordane: The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Gasoline Range Organics (GRO): Gasoline Range Organics (GRO) results include all chromatographic peaks eluting from Methyl tert butyl ether through Naphthalene, with the exception of GRO analysis in support of State of Ohio programs, which includes all chromatographic peaks eluting from Hexane through Dodecane.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. In addition, the 'PFAS, Total (6)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA, PFDA and PFOS. For MassDEP DW compliance analysis only, the 'PFAS, Total (6)' result is defined as the summation of results at or above the RL. Note: If a 'Total' result is requested, the results of its individual components will also be reported.

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- F** - The ratio of quantifier ion response to qualifier ion response falls outside of the laboratory criteria. Results are considered to be an estimated maximum concentration.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

Report Format: Data Usability Report



Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

Data Qualifiers

- ND** - Not detected at the reporting limit (RL) for the sample.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)
- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.
- V** - The surrogate associated with this target analyte has a recovery outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)
- Z** - The batch matrix spike and/or duplicate associated with this target analyte has a recovery/RPD outside the QC acceptance limits. (Applicable to MassDEP DW Compliance samples only.)

Project Name: DUNSTABLE - GROTON
Project Number: G-5078

Lab Number: L2254865
Report Date: 10/18/22

REFERENCES

- 1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.
- 97 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA, IIB, IIIA, IIIB, IIIC, IIID, VA, VB, VC, VIA, VIB, VIIIA and VIIIB, July 2010.
- 121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.
- 141 EPA Test Methods (SW-846) with QC Requirements & Performance Standards for the Analysis of EPA SW-846 Methods under the Massachusetts Contingency Plan, WSC-CAM-IIA and IIB, November 2021.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 625/625.1: alpha-Terpineol

EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D/8270E: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene,

3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE,**

EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:**

Ammonia-N, **LCHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E,**

SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300: Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II,

Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1 Hg.**

EPA 522, EPA 537.1.

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 10/4/22

ALPHA Job #: L2254865

8 Walkup Drive
Westboro, MA 01581
Tel: 508-898-9220

320 Forbes Blvd
Mansfield, MA 02048
Tel: 508-822-9300

Project Information

Project Name: Dunstable - Groton
Project Location: Groton, MA
Project #: G-5078
Project Manager: Matt Wagner
ALPHA Quote #:

Report Information - Data Deliverables

ADEX EMAIL

Billing Information

Same as Client info PO #:

Client Information

Client: Tygh & Bond
Address: 53 Southampton Rd
Westfield MA 01085
Phone: 413-562-1600
Email: anguidi@tyghbond.

Turn-Around Time

Standard RUSH (only confirmed if pre-approved)
Date Due:

Regulatory Requirements & Project Information Requirements

Yes No MA MCP Analytical Methods Yes No CT RCP Analytical Methods
 Yes No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
 Yes No GW1 Standards (Info Required for Metals & EPH with Targets)
 Yes No NPDES RGP
 Other State /Fed Program _____ Criteria _____

Additional Project Information:

ANALYSIS										SAMPLE INFO		
VOC: <input checked="" type="checkbox"/> 8260 <input type="checkbox"/> 824 <input type="checkbox"/> 524.2	SVOC: <input checked="" type="checkbox"/> ABN <input type="checkbox"/> PAH	METALS: <input type="checkbox"/> MCP 13 <input type="checkbox"/> MCP 14 <input type="checkbox"/> RCP 15	METALS: <input type="checkbox"/> RCRA5 <input checked="" type="checkbox"/> RCRA8	EPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	VPH: <input type="checkbox"/> Ranges & Targets <input type="checkbox"/> Ranges Only	<input checked="" type="checkbox"/> PCB <input type="checkbox"/> PEST	TPH: <input checked="" type="checkbox"/> Quant Only <input type="checkbox"/> Fingerprint	Conductivity			Filtration	
										<input type="checkbox"/> Field		
										<input type="checkbox"/> Lab to do		
										Preservation		
										<input type="checkbox"/> Lab to do		
										Sample Comments		

TOTAL # BOTTLES

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler Initials													
		Date	Time															
54865-01	S-5	10/4/22	1215	S	NG	✓	✓		✓	✓	✓							
02	S-12	↓	1400	↓	↓	✓	✓		✓	✓	✓							
03	S-17	↓	1535	↓	↓	✓	✓		✓	✓	✓							

- Container Type**
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle
- Preservative**
A= None
B= HCl
C= HNO₃
D= H₂SO₄
E= NaOH
F= MeOH
G= NaHSO₄
H= Na₂S₂O₃
I= Ascorbic Acid
J= NH₄Cl
K= Zn Acetate
O= Other

Container Type	A	AG	AG	AG	AG	AG
Preservative	F	A	A	A	A	A

Relinquished By:	Date/Time	Received By:	Date/Time
<u>W. Danaher</u>	<u>10/4/22 16:50</u>	<u>Anguidi</u>	<u>10/4/22 17:55</u>

All samples submitted are s
Alpha's Terms and Conditio
See reverse side.
FORM NO: 01-01 (rev. 12-Mar-201

Method Blank Summary Form 4 Volatiles

Client	: Tighe & Bond, Inc.	Lab Number	: L2254865
Project Name	: DUNSTABLE - GROTON	Project Number	: G-5078
Lab Sample ID	: WG1699160-5	Lab File ID	: V29221012A05
Instrument ID	: VOA129		
Matrix	: SOIL	Analysis Date	: 10/12/22 08:40

Client Sample No.	Lab Sample ID	Analysis Date
WG1699160-3LCS	WG1699160-3	10/12/22 07:38
WG1699160-4LCSD	WG1699160-4	10/12/22 07:59
S-5	L2254865-01	10/12/22 11:20
S-12	L2254865-02	10/12/22 11:41
S-17	L2254865-03	10/12/22 12:02

Calibration Verification Summary

Form 7

Volatiles

Client : Tighe & Bond, Inc.
 Project Name : DUNSTABLE - GROTON
 Instrument ID : VOA129
 Lab File ID : V29221012A01
 Sample No : WG1699160-2
 Channel :

Lab Number : L2254865
 Project Number : G-5078
 Calibration Date : 10/12/22 07:17
 Init. Calib. Date(s) : 09/21/22 09/21/22
 Init. Calib. Times : 19:03 22:53

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
Fluorobenzene	1	1	-	0	20	103	0
Dichlorodifluoromethane	0.266	0.241	-	9.4	20	102	0
Chloromethane	0.42	0.279	-	33.6*	20	75	0
Vinyl chloride	0.33	0.271	-	17.9	20	91	0
Bromomethane	0.175	0.214	-	-22.3*	20	153	0
Chloroethane	0.2	0.167	-	16.5	20	98	0
Trichlorofluoromethane	0.362	0.416	-	-14.9	20	124	0
Ethyl ether	0.119	0.111	-	6.7	20	105	0
1,1-Dichloroethene	0.224	0.223	-	0.4	20	108	0
Carbon disulfide	0.684	0.633	-	7.5	20	101	0
Freon-113	0.236	0.259	-	-9.7	20	113	0
Acrolein	0.047	0.034	-	27.7*	20	87	0
Methylene chloride	40	35.298	-	11.8	20	104	0
Acetone	40	24.331	-	39.2*	20	72	0
trans-1,2-Dichloroethene	0.278	0.257	-	7.6	20	101	0
Methyl acetate	0.232	0.143	-	38.4*	20	72	0
Methyl tert-butyl ether	0.668	0.634	-	5.1	20	102	0
tert-Butyl alcohol	0.043	0.029	-	32.6*	20	77	-0.01
Diisopropyl ether	1.014	0.781	-	23*	20	83	0
1,1-Dichloroethane	0.507	0.445	-	12.2	20	97	0
Halothane	0.21	0.198	-	5.7	20	102	0
Acrylonitrile	40	24.918	-	37.7*	20	77	0
Ethyl tert-butyl ether	0.908	0.795	-	12.4	20	95	0
Vinyl acetate	0.661	0.532	-	19.5	20	88	0
cis-1,2-Dichloroethene	0.305	0.281	-	7.9	20	103	0
2,2-Dichloropropane	0.434	0.433	-	0.2	20	111	0
Bromochloromethane	0.155	0.151	-	2.6	20	109	0
Cyclohexane	0.546	0.443	-	18.9	20	90	0
Chloroform	0.487	0.479	-	1.6	20	107	0
Ethyl acetate	0.337	0.217	-	35.6*	20	73	0
Carbon tetrachloride	0.368	0.387	-	-5.2	20	112	0
Tetrahydrofuran	0.123	0.074	-	39.8*	20	69	0
Dibromofluoromethane	0.257	0.248	-	3.5	20	101	0
1,1,1-Trichloroethane	0.407	0.439	-	-7.9	20	114	0
2-Butanone	0.175	0.099	-	43.4*	20	66	0
1,1-Dichloropropene	0.349	0.36	-	-3.2	20	105	0
Benzene	1.075	1.012	-	5.9	20	100	0
tert-Amyl methyl ether	0.781	0.726	-	7	20	101	0
1,2-Dichloroethane-d4	0.277	0.299	-	-7.9	20	117	0
1,2-Dichloroethane	0.363	0.366	-	-0.8	20	108	0
Methyl cyclohexane	0.496	0.476	-	4	20	101	0
Trichloroethene	0.305	0.292	-	4.3	20	108	0
Dibromomethane	0.174	0.167	-	4	20	107	0

* Value outside of QC limits.



Calibration Verification Summary

Form 7

Volatiles

Client : Tighe & Bond, Inc.
 Project Name : DUNSTABLE - GROTON
 Instrument ID : VOA129
 Lab File ID : V29221012A01
 Sample No : WG1699160-2
 Channel :

Lab Number : L2254865
 Project Number : G-5078
 Calibration Date : 10/12/22 07:17
 Init. Calib. Date(s) : 09/21/22 09/21/22
 Init. Calib. Times : 19:03 22:53

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
1,2-Dichloropropane	0.312	0.264	-	15.4	20	93	0
2-Chloroethyl vinyl ether	0.193	0.155	-	19.7	20	86	0
Bromodichloromethane	0.399	0.372	-	6.8	20	105	0
1,4-Dioxane	0.00351	0.00294*	-	16.2	20	88	0
cis-1,3-Dichloropropene	0.453	0.442	-	2.4	20	101	0
Chlorobenzene-d5	1	1	-	0	20	101	0
Toluene-d8	1.259	1.296	-	-2.9	20	104	0
Toluene	0.889	0.847	-	4.7	20	103	0
4-Methyl-2-pentanone	0.151	0.105	-	30.5*	20	74	0
Tetrachloroethene	0.365	0.401	-	-9.9	20	113	0
trans-1,3-Dichloropropene	0.534	0.52	-	2.6	20	102	0
Ethyl methacrylate	0.476	0.398	-	16.4	20	92	0
1,1,2-Trichloroethane	0.265	0.238	-	10.2	20	100	0
Chlorodibromomethane	0.368	0.348	-	5.4	20	98	0
1,3-Dichloropropane	0.517	0.492	-	4.8	20	100	0
1,2-Dibromoethane	0.313	0.301	-	3.8	20	102	0
2-Hexanone	0.307	0.198	-	35.5*	20	72	0
Chlorobenzene	0.983	0.995	-	-1.2	20	106	0
Ethylbenzene	1.671	1.676	-	-0.3	20	106	0
1,1,1,2-Tetrachloroethane	0.35	0.363	-	-3.7	20	106	0
p/m Xylene	0.649	0.676	-	-4.2	20	107	0
o Xylene	0.631	0.65	-	-3	20	107	0
Styrene	1.056	1.074	-	-1.7	20	106	0
1,4-Dichlorobenzene-d4	1	1	-	0	20	107	0
Bromoform	0.452	0.39	-	13.7	20	99	0
Isopropylbenzene	3.187	3.16	-	0.8	20	109	0
4-Bromofluorobenzene	0.9	0.884	-	1.8	20	105	0
Bromobenzene	0.821	0.81	-	1.3	20	113	0
n-Propylbenzene	3.761	3.779	-	-0.5	20	110	0
1,4-Dichlorobutane	1.119	0.869	-	22.3*	20	90	0
1,1,2,2-Tetrachloroethane	0.805	0.665	-	17.4	20	99	0
4-Ethyltoluene	3.175	3.186	-	-0.3	20	111	0
2-Chlorotoluene	2.265	2.26	-	0.2	20	112	0
1,3,5-Trimethylbenzene	2.793	2.811	-	-0.6	20	112	0
1,2,3-Trichloropropane	0.623	0.556	-	10.8	20	104	0
trans-1,4-Dichloro-2-buten	0.278	0.22	-	20.9*	20	95	0
4-Chlorotoluene	2.344	2.333	-	0.5	20	112	0
tert-Butylbenzene	2.423	2.399	-	1	20	109	0
1,2,4-Trimethylbenzene	2.774	2.767	-	0.3	20	111	0
sec-Butylbenzene	3.527	3.501	-	0.7	20	108	0
p-Isopropyltoluene	3.141	3.161	-	-0.6	20	110	0
1,3-Dichlorobenzene	1.609	1.623	-	-0.9	20	116	0
1,4-Dichlorobenzene	1.627	1.623	-	0.2	20	114	0

* Value outside of QC limits.



Calibration Verification Summary Form 7 Volatiles

Client : Tighe & Bond, Inc.
 Project Name : DUNSTABLE - GROTON
 Instrument ID : VOA129
 Lab File ID : V29221012A01
 Sample No : WG1699160-2
 Channel :

Lab Number : L2254865
 Project Number : G-5078
 Calibration Date : 10/12/22 07:17
 Init. Calib. Date(s) : 09/21/22 09/21/22
 Init. Calib. Times : 19:03 22:53

Compound	Ave. RRF	RRF	Min RRF	%D	Max %D	Area%	Dev(min)
p-Diethylbenzene	1.922	1.915	-	0.4	20	112	0
n-Butylbenzene	2.698	2.791	-	-3.4	20	112	0
1,2-Dichlorobenzene	1.519	1.52	-	-0.1	20	113	0
1,2,4,5-Tetramethylbenzene	2.884	2.961	-	-2.7	20	112	0
1,2-Dibromo-3-chloropropan	0.158	0.121	-	23.4*	20	91	0
1,3,5-Trichlorobenzene	1.185	1.272	-	-7.3	20	122	0
Hexachlorobutadiene	0.55	0.602	-	-9.5	20	122	0
1,2,4-Trichlorobenzene	1.102	1.165	-	-5.7	20	118	-0.1
Naphthalene	2.872	2.537	-	11.7	20	101	-0.1
1,2,3-Trichlorobenzene	1.033	1.059	-	-2.5	20	116	-0.1

* Value outside of QC limits.



Performance Evaluation Mixture Summary
Form 15
Pesticides

Client	: Tighe & Bond, Inc.	Lab Number	: L2254865
Project Name	: DUNSTABLE - GROTON	Project Number	: G-5078
Instrument ID	: PEST18	Analysis Date	: 10/17/22 09:23
PEM Standard	: R1621736-1		
Column 1	: RTX-5	Column 2	: RTX-CLPPesticides2

Parameter	Signal 1	Signal 2
4,4'-DDE	4143960.83851	3126673.37508
Endrin	1506638357.75	1510609849.5212
4,4'-DDD	1939139.6823	12172331.8269
4,4'-DDT	2490202121.1357	2693105754.5726
Endrin Aldehyde	0	0
Endrin Ketone	3818560.53074	4008773.79889

Parameter	%Breakdown 1	%Breakdown 2
Endrin	0.253	0.265
DDT	0.244	0.565

Tighe&Bond

APPENDIX E

G-5078
April 3, 2023

Jason Silva
Town Administrator
Town of Dunstable
511 Main Street
Dunstable, Massachusetts 01827

**Re: Public Notification of Release Notification
Groton-Dunstable Regional School District
703 Chicopee Row
Groton, Massachusetts
MassDEP RTN 2-21961**

Dear Mr. Silva:

In accordance with the Public Notification procedures of the Massachusetts Contingency Plan (MCP) 310 CMR 40.1406, we are hereby notifying you of the submittal of a Release Notification Form (RNF) for the above referenced site to the Massachusetts Department of Environmental Protection (MassDEP). A copy of the Site Plan and RNF (BWSC 103 Form) is attached.

This RNF is being submitted concurrently with an Immediate Response Action (IRA) Plan to address the release of per- and polyfluoroalkyl substances (collectively known as PFAS) in soil and groundwater at the Groton-Dunstable Regional High School located at 703 Chicopee Row in Groton, Massachusetts.

For more information about the public involvement regulations that require this notice and a description of such public involvement activities available under the MCP, see <https://www.mass.gov/lists/public-involvement-during-cleanup-of-contaminated-properties>.

Please note that this letter and the attached MassDEP form are for notification purposes only and no action is being asked of you in response to this notice. A copy of the RNF is available for review online at <https://eeaonline.eea.state.ma.us/> – Release Tracking Number (RTN) 2-21961.

Should you have any questions, please contact Matt Wagner at mgwagner@tighebond.com.

Sincerely,

TIGHE & BOND, INC.



Michael Scherer
Senior Environmental Scientist

Enclosures

Cc: Dunstable Board of Health

J:\G\G5078 Groton-Dunstable Regional School District\Reports\IRA Plan - April 2022\Public Notice - Dunstable.docx



G-5078
April 3, 2023

Mark Haddad
Town Manager
Town of Groton
173 Main Street
Groton, Massachusetts 01450

**Re: Public Notification of Release Notification
Groton-Dunstable Regional School District
703 Chicopee Row
Groton, Massachusetts
MassDEP RTN 2-21961**

Dear Mr. Haddad:

In accordance with the Public Notification procedures of the Massachusetts Contingency Plan (MCP) 310 CMR 40.1406, we are hereby notifying you of the submittal of a Release Notification Form (RNF) for the above referenced site to the Massachusetts Department of Environmental Protection (MassDEP). A copy of the Site Plan and RNF (BWSC 103 Form) is attached.

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Should you have any questions, please contact Matt Wagner at mgwagner@tighebond.com.

Sincerely,

TIGHE & BOND, INC.



Michael Scherer
Senior Environmental Scientist

Enclosures

Cc: Groton Board of Health

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