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Report

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583 Quarry Hill Road
Pownal, Vermont

Site Investigation Report
SMS #2023-5342

Prepared for:
Vermont Department of Environmental Conservation

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EXECUTIVE SUMMARY

Weston & Sampson, on behalf of the Vermont Department of Environmental Conservation (VTDEC) performed a Site Investigation within a rural residential area of Pownal, Vermont in response to the discovery of per- and polyfluoroalkyl substances (PFAS) contamination in the private well supply located at 583 Quarry Hill Road in Pownal, Vermont (the Site). Work completed included collection of samples from ten residential water supply wells, collection of three soil samples from the Site, and evaluation of potential source materials. Findings of the Site Investigation are as follows:

- Three (3) of the ten (10) residential water supplies sampled as part of this Site Investigation have concentrations of the five (5) regulated PFAS compounds exceeding the Vermont Maximum Contaminant Level (MCL) for drinking water of 20 parts per trillion (ppt). The primary PFAS compound detected in water supplies is perfluorooctanoic acid (PFOA) but also includes notable detections of perfluorobutanoic acid (PFBA), perfluorobutanesulfonic acid (PFBS), perfluoropentanoic acid (PFPeA), perfluorohexanoic acid (PFHxA), perfluoroheptanoic acid (PFHpA), and perfluorooctanesulfonic acid (PFOS). Point of entry treatment (POET) systems have been installed at these residences to mitigate the exposure of PFAS through ingestion.

- Three (3) water supplies have PFAS concentrations detected below the MCL. The extent of PFAS in residential drinking water supplies relative to the Site has not been defined to the northwest.

- PFAS, primarily PFOA, appears to be leaching from native soil at the Site into groundwater then migrating into the impacted drinking water supplies through hydraulically connected bedrock fractures. The source of PFAS in native soil is unknown but may include, in order of likelihood:
    - Disposal of PFAS containing materials from the former Warren Wire/General Cable facility at the Site and/or nearby properties when this area was part of the Dodge Farm.
    - Use of PFAS containing fill materials during development of the Site as a single-family residence. Fill soil imported to the Site from the Bisson Excavating gravel pit in Pownal and the Old Williams Inn construction site in Williamstown, Massachusetts could be contributing PFAS to groundwater contamination. However, leachate from these soils does not result in dissolved PFAS concentrations that would result in MCL exceedances.
    - Discharge from in-ground wastewater disposal systems at or nearby the Site.
    - Aerial deposition from nearby known PFAS sources including the Former Warren Wire/General Cable facility and the former Pownal Tannery.
    - Migration of PFOA contaminated groundwater from the former Warren Wire Plant #3

The following data gaps have been identified that require additional assessment:

- The nature and extent of PFAS in bedrock water supply wells is not fully defined. Additional water supply sampling should be performed to the northwest of the Site.

- The nature and extent of PFAS in native soil that may be contributing to drinking water MCL exceedances is unknown.

- It is unknown if PFAS contaminated groundwater discharges to unnamed streams and whether there is potential exposure to Site users and livestock through direct contact and/or ingestion of surface water.

Weston & Sampson offers the following recommendations:

- Interviews should be conducted with area residents who have been living in the area for multiple decades to establish past land use practices at the Site and nearby properties, including the former Dodge Farm.

- Additional water supply well sampling from properties to the northwest and west of the Site to further evaluate the extent of PFAS in bedrock groundwater. We recommend sampling water supplies at the addresses listed below. We recommend sampling up to five water supplies that were sampled for PFAS in 2016 and located west of the Site to further evaluate PFAS composition, source, and temporal trends. Previous PFAS results are summarized in paratheses next to proposed resample locations, below.
    - 716 North Pownal Road (access previously denied – recommend that VTDEC contact to discuss results of this Site Investigation and request sampling)
    - 393 North Pownal Road
    - 372 North Pownal Road
    - 369 North Pownal Road
    - 326 North Pownal Road
    - 286 North Pownal Road
    - 225 North Pownal Road (Non-detect for PFAS on 6/23/2016)
    - 191 North Pownal Road
    - 3138 Route 346 (Non-detect for PFAS on 6/8/2016 – adjacent to two properties with POET systems)
    - 3239 Route 346 (24.08 ng/l for sum of PFOA and PFOS on 11/10/2016)
    - 3437 Route 346 (8.6 ng/l of PFOA on 4/27/2016)
    - 3503 Route 346 (7.77 ng/l of PFOA on 6/9/2016)

- Additional soil assessment at the Site and surrounding properties should be completed to further evaluate the nature and extent of PFAS in soil.
    - Depth discrete soil samples should be collected from four soil borings advanced near the Site water supply and within fill materials near the residence. Up to three soil samples should be collected from each boring that represent surface soil (0-18 inches), fill materials, and native soil underlying fill/overlying bedrock.
    - Depth discrete soil samples should be collected from ten grid-based locations in undisturbed areas of the Site including east of the water supply and west of the residence, from the agricultural field located west of the Site (581 Quarry Hill Road), and throughout the 871 North Pownal Road property to evaluate “background” PFAS concentrations in soil. Two soil samples should be collected at each location including surface soil (0-18 inches) and underlying native soil at depths up to 3 feet below grade.
    - A subset of the soil samples described above should undergo SPLP extraction and PFAS analysis to evaluate leachability of PFAS from soil to groundwater.
    - If access is granted, soil samples should be collected from Bisson gravel pit and Old Williams Inn sites for PFAS analysis to evaluate soil quality at the source of fill materials.

- Surface water should be sampled from the two unnamed streams located to the west and south of the Site to determine if there is a risk of exposure to PFAS through contact and/or ingestion of surface water. Surface water samples should be collected from near seeps, if possible. The stream located west of the Site is on a property where access was previously denied (716 North Pownal Road) and may need to be sampled from the culvert outfall within the North Pownal Road right-of-way.

If following completion of the tasks described above, the Warren Wire Plant #3 is still considered a potential source we recommend completing borehole geophysics of several water supplies between the Site and Plat #3 to determine the relationship between the geophysical setting of the Site, Plant #3, and the distribution of PFAS in drinking water supplies. Recommended geophysical tools include gamma logging to identify different lithologies, acoustical bore hole imaging and caliper logging to identify fracture orientation and aperture, and a heat pulse flow meter, temperature, and specific conductance to evaluate groundwater flow within boreholes.

Additional groundwater assessment is recommended as a separate investigation to define the nature and extent of PFOA in groundwater released from the former Warren Wire Plant #3.The groundwater assessment should include sampling nearby drinking water supplies located on Burlington Road, Route 346, Lincoln Street, and Palmer Drive and expansion/sampling of the groundwater monitoring well network at the plant. No further investigation is recommended currently regarding the potential aerial deposition of PFAS from known sources in Pownal. This release mechanism and migration pathway appears unlikely based on the absence of widespread PFAS contamination in area water supplies and differences in PFAS composition between the Site and other known sources.

1.0 SITE BACKGROUND

Weston & Sampson Engineers, Inc. (Weston & Sampson), on behalf of the Vermont Department of Environmental Conservation (VTDEC), has prepared this Site Investigation (SI) Report for the property located at 583 Quarry Hill Road in Pownal, Vermont (the Site; Figure 1).

1.1 Site Location

Street Address: 583 Quarry Hill Road, Pownal, VT
Latitude (North): 42.80155˚
Longitude (West): 73.25198˚
Elevation: 754 feet above sea level
Site Owner: Brian O'Neil and Signe Kutzer
Email: bto138@gmail.com; signekutzer@gmail.com
Phone: 413-884-5351
Site Occupants: Residential
County: Bennington
Parcel ID (SPAN): 495-156-10363
Size: 2.61-acres
Sites Management Section #: 2023-5342

1.2 Current Use of Property

The Site is in residential use.

1.3 Current Use of Adjacent Properties

Properties adjacent to the Site are in rural residential and agricultural use. A dairy creamery adjoins the Site to the south and west. The creamery and a barn are located immediately south of the Site and agricultural fields used to graze cattle are located west of the Site. A large agricultural field is located north of the Site across North Pownal Road. A single family residence adjoins the Site to the east.

1.4 Site History

The current residence was constructed in 2022-2023. Based on satellite imagery, the Site has been forested since at least 1985. A review of Town of Pownal land records was completed to establish a chain of title for the Site and is summarized in the table below. Copies of Pownal Land Records are provided as Appendix A. The Site was part of the Dodge Farm from 1971 to 1986 when title was transferred to Cleeland Corporation, a real-estate holding company owned by the Dodge family.

Chain of Title Review Summary			
Grantor	Grantee	Book/Page	Date Recorded
James J. Rondinone and Linda L. Rondinone	Brian T. O'Neil and Signe E. O'Neil	181/87	4/15/2022
Cleeland Corporation	James J. Rondinone and Linda L. Rondinone	137/571	12/17/2004
Cleveland E. Dodge, Jr. and Phyllis B. Dodge	Cleeland Corporation	82/524	11/18/1986

Chain of Title Review Summary			
Grantor	Grantee	Book/Page	Date Recorded
Earle V. Church and Helen K. Church	Cleveland E. Dodge, Jr. and Phyllis B. Dodge	58/387	June 18, 1971

1.5 Previous Environmental Investigations

Extensive sampling and per- and polyfluoroalkyl substances (PFAS) analysis of water supplies, groundwater monitoring wells, surface water, and soil was conducted in Pownal, Vermont from 2016-2017 within areas of interest that included near the former Warren Wire/General Cable facility, former Warren Wire Plant #3, Pownal Tannery site, former Barlow Gravel Pit/Town Dump site, and the former Dodge Farm Dump Site. These areas of interest are shown on Figure 2 relative to the Site. This work identified releases via stack emissions and liquid discharges from the Warren Wire/General Cable facility that impacted several nearby overburden and bedrock water supplies with PFAS, primarily perfluorooctanoic acid (PFOA), exceeding the Vermont Maximum Contaminant Level (MCL) of 20 parts per trillion (ppt) for five regulated PFAS compounds. PFAS, particularly PFOA and perfluorooctanesulfonic acid (PFOS) was also identified in North Pownal water supplies exceeding the MCL and appears to be associated with the Pownal Tannery site and/or former Barlow Gravel Pit/Town Dump site. The bedrock water supply at the former Dodge Farm Dump Site was non-detect for PFAS, however, PFOA was detected in a shallow irrigation well at 7.72 ppt. Based on the results of this investigation, 10 point of entry treatment (POET) systems were installed to reduce PFAS concentrations in impacted water supplies to levels below the MCL. Water supply PFOA and PFOS concentrations from the 2016-2017 PFAS investigation are shown on Figures 3 and 4.

The Site water supply was analyzed for PFAS following installation in March 2023. Several PFAS compounds were detected. Of the five PFAS compounds regulated in Vermont drinking water, PFOA was detected at a concentration of 45 nanograms per liter (ng/l), exceeding the MCL of 20 ng/l. The water supply was retested for PFAS in July 2023 and contained 90.3 ng/l of PFOA.

1.6 Purpose

This Site Investigation was conducted to evaluate the nature and extent of PFAS detected in the Site's water supply.

2.0 FIELD ACTIVITIES

Field activities, completed between August 22 and October 30, 2023, included the sampling and analysis of drinking water and soil in accordance with the Work Plan dated August 28, 2023, revised September 1, 2023, and approved by VTDEC. Field sampling forms and Site photographs are included as Appendix B.

2.1 Site Reconnaissance

Weston & Sampson completed a visual inspection of the Site and surrounding properties on August 22, 2023, for evidence of potential source materials. The entirety of the Site was accessed by foot. Nearby properties were observed from Quarry Hill Road and North Pownal Road. Fill materials associated with the Site development as a single-family residence were apparent in the area surrounding the house. The Site owner, Mr. O'Neil, reported that approximately 4,000 cubic yards of fill was recently imported to the Site during construction of the residence. According to Mr. O'Neil, approximately 1,000 cubic yards was imported by a local excavation company, Bisson Excavating, Inc. (Bisson Excavating), and had evidence of fill materials, including brick. The remaining approximately 3,000 cubic yards of imported fill was reportedly sourced from a construction project at the Old Williams Inn located at 101 Spring Street in Williamstown, Massachusetts and appeared to consist of crushed stone, used for driveway construction materials, and bank run gravel. Areas of the Site not recently disturbed by development are wooded. Topography slopes gently to the north, east, and south and steeply to the west away from the house-site.

The area surrounding the Site is in rural residential and agricultural use. No evidence of potential source materials was observed during the Site reconnaissance, which included walking the 581 and 583 Quarry Hill Road properties and observing other nearby properties from Quarry Hill Road and North Pownal Road. The headwaters of two unnamed streams are located to the south, on the 431 Quarry Hill Road property, and to the west, on the 7171 North Pownal Road Property.

The Site is served by an in-ground on-site wastewater disposal system located to the north of the residence (Figure 6). The disposal system consists of a 1,500-gallon concrete septic tank and mounded leach field. The wastewater disposal system permit and design details are provided in Appendix C.

2.2 Drinking Water Sampling

Drinking water samples were collected from the ten (10) residences summarized in the table, below. Samples were collected by running a tap, typically the kitchen sink, for a minimum of ten minutes prior to filling sample containers from a location prior to any water treatment, typically the pressure tank spigot. Samples were collected into laboratory provided HDPE plastic 250 ml capacity ammonium acetate preserved sample containers.

Blind field duplicates were collected from 581 Quarry Hill Road, 583 Quarry Hill Road, and 871 North Pownal Road by filling additional sample containers. Three field blanks were collected, one (1) on September 13, 2023, at 583 Quarry Hill Road, one (1) on October 4, 2023, at 581 Quarry Hill Road, and one (1) on October 30, 2023, from 871 North Pownal Road. Laboratory provided field blanks were collected by pouring PFAS-free water from one bottle into another within the sampling area.

581 Quarry Hill Road was resampled on October 4, 2023, due to a laboratory error with the initial sample, and again on October 30, 2023, due to PFAS exceedances of the MCL. 871 North Pownal Road was resampled on October 4, 2023, due to PFAS exceedances of the MCL.

Private Water Supply Sample Locations			
Address	Address	Address	Address
320 Quarry Hill Road	431 Quarry Hill Road	581 Quarry Hill Road	583 Quarry Hill Road
717 N. Pownal Road	871 N. Pownal Road	990 N. Pownal Road	1187 N. Pownal Road
1522 N. Pownal Road	737 Mount Anthony Road		

The details of the residence location, owner contact information, sampling times, materials inventory and use in the sampling area, well construction details (if available), global positioning system (gps) location of the well, and water treatment system details were entered into a digital data collection form on a tablet for downloading into a database. Sampling details are summarized in Appendix B.

All samples were submitted to Alpha Analytical of Mansfield, Massachusetts (Alpha) for PFAS analysis by EPA Method 533.

2.3 Soil Sampling

One (1) soil sample was collected from each of three (3) test pits (TP-1, TP-2, and TP-3; Figure 6) excavated on October 4, 2023. Test pits were excavated by the Site owner and observed by Weston & Sampson. Soil samples collected from TP-1 and TP-2 are representative of fill soils imported to the Site. TP-1, located north of the residence, targeted fill soils imported by Bisson Excavating from their gravel pit located west of Route 346 in Pownal, VT (Figure 2). TP-2, located south of the house, targeted fill soils imported from Williamstown, Massachusetts reportedly generated during construction activities at the Willams Inn. TP-3, located near the water supply well east of the house, was intended to target fill soils reportedly imported by Bisson Excavating and used to backfill the water line between the well and the house. However, soils in TP-3 appeared to be undisturbed native silt and clay. A field duplicate was collected from TP-3 by filling an additional sample container. Soil sample locations are shown on Figure 6.

Soil samples were analyzed for PFAS by isotope dilution (modified EPA Method 537). Synthetic precipitation leaching procedure (SPLP) extraction was performed on all soil samples, except the duplicate, and the leachate analyzed for PFAS to evaluate leachability of PFAS from soil. An equipment blank (EB) was collected from the sampling device by pouring laboratory provided PFAS-free water over the device and collecting in sample containers. The equipment blank sample was analyzed for PFAS by EPA Method 533.

2.4 Investigation Derived Waste

No aqueous wastes were generated. Soil excavated from test pits was used to backfill test pits following sampling. No excess soil was generated. Sampling supplies and personal protective equipment was disposed of as solid waste.

2.5 Analytical Methods

Drinking water and soil samples were submitted for analysis at Alpha Analytical, located in Mansfield, Massachusetts. A summary of analytical methods is provided in the table below:

Parameter	Media Type	Analytical Method
Per- and Polyfluoroalkyl Substances (PFAS)	Drinking Water	533
	Soil	Isotope Dilution (537M)
	Soil - Leachability	Synthetic Precipitation Leaching Procedure (SPLP) Extraction/533

2.6 Standard Operating Procedures

The following Weston & Sampson Standard Operating Procedures were used during this Site Investigation. Copies of the SOPs can be made available upon request.

SOP-8	Decontaminating Equipment
SOP-10	Sampling Soil with a Scoop or Hand Auger
SOP-23	Water Supply Sampling for PFAS Compounds
SOP-26	General PFAS Considerations

2.7 Deviations from the Work Plan

The following work plan deviations were made:

- Electricity and water were turned off at 350 Quarry Hill Road, therefore, a drinking water sample could not be collected from the water supply.
- The property owners of 716 and 1557 North Pownal Road declined to have a sample collected from their water supplies.
- A drinking water sample was collected from 737 Mount Anthony Road at the request of the homeowner. This additional sample was approved by VTDEC prior to collection.

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3.0 RESULTS

3.1 Screening Criteria

Drinking water results were compared to the Vermont MCL of 20 ng/l for the sum of five PFAS compounds (VT5) as listed in Chapter 21: Water Supply Rule of the Vermont Agency of Natural Resources Environmental Protection Rules, effective March 17, 2020. The five (5) regulated PFAS include:

- Perfluorohexane sulfonic acid (PFHxS)
- Perfluoroheptanoic acid (PFHpA)
- Perfluorononanoic acid (PFNA)
- Perfluorooctanesulfonic acid (PFOS)
- Perfluorooctanoic acid (PFOA)

Soil results were compared to the Vermont Soil Standards (VSS) for residential and non-residential use published in the Vermont Investigation and Remediation of Contaminated Properties Rule (I-Rule), effective July 6, 2019. Soil leachate results were compared to the Vermont MCL for drinking water described above.

3.2 Drinking Water Results

A summary of all PFAS results for each 911 address sampled is included as **Table 1.** This table presents the summed reported concentrations of the VT5 PFAS compounds. Laboratory reports and tabulated data have been presented to the VTDEC previously as the data was received. The laboratory reports are included as **Appendix D.**

The sum concentration of the VT5 PFAS compounds exceeded the MCL at three (3) residences including 581 Quarry Hill Road (26.6 ng/l), 583 Quarry Hill Road (180 ng/l), and 871 North Pownal Road (30.4 ng/l). Concentrations between the detection limit and 20 ppt are reported at three (3) locations, 431 Quarry Hill Road (2.24 ng/l), 717 North Pownal Road (13.1 ng/l), and 990 North Pownal Road (14.0 ng/l).

The dominant PFAS quantified in all water supplies is PFOA. The Site water supply sample has more variability and higher concentrations of PFAS compounds relative to other water supplies. PFOA is reported at six (6) locations at concentrations ranging from 2.24 ng/l (431 Quarry Hill Road) to 161 ppt (583 Quarry Hill Road). The relative concentrations of VT5 PFAS compounds for the recently sampled water supplies are shown on **Figure 5**. These relative concentrations are also shown on **Figure 3** along with the samples results from 2016/2017 throughout the Pownal area.

3.3 Soil Sampling Results

A summary of PFAS results for each test pit location is included as **Table 2.** This table presents soil results and soil leachate analyzed for PFAS following SPLP extraction. The laboratory reports are included as **Appendix D.** The sum of VT5 PFAS compounds are shown on **Figure 6**.

Several PFAS compounds were detected above laboratory reporting limits, including PFBA, PFHxA, PFHpA, PFOA, and PFOS. No PFAS compounds were detected at concentrations above their residential VSS. PFOA was detected at the highest concentration in soil sample TP-3 (0.0028 milligrams per kilogram (mg/kg).

PFAS compounds detected in leachate samples following SPLP extraction were similar to PFAS compounds and ratios detected in Site groundwater. Like groundwater, PFOA was the dominant PFAS compound detected in soil leachate. TP-3 leachate had a PFOA concentration of 118 ng/l and a VT5 PFAS concentration of 126 ng/l. VT5 PFAS concentrations in TP-1 and TP-2 leachate were 10.1 ng/l and 6.62 ng/l, respectively (Figure 6).

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4.0 DATA USABILITY

4.1 Laboratory Data Evaluation

Weston & Sampson performed a Tier I evaluation of the data to identify bias or other interference that could affect the quality of sample results. Quality control components that were evaluated include the following:

- Data completeness
- Holding times
- Sample preservation
- Blank results
- Surrogate recoveries
- Laboratory control sample results
- Field duplicates

The following QA/QC samples were collected and analyzed:

Parameter	Matrix	Number of Samples	Field Blanks	Equipment Blanks	Blind Field Duplicates
PFAS	Drinking Water	12	3	0	3
	Soil	3	0	1	1
	Soil - Leachability	3	0	0	0

4.2 PARCCS Evaluation

Weston & Sampson evaluated the data in general accordance with the PARCCS (precision, accuracy, representativeness, completeness, comparability, and sensitivity) parameters outlined in the *U.S. Environmental Protection Agency Guidance on Quality Assurance Project Plans (December 2002).*

4.2.1 Precision

Precision is a measure of agreement among individual measurements of the same property and is generally expressed as the reproducibility of the analytical result between initial sample and field duplicate as expressed by the relative percent difference (RPD). Precision is a measure of the reproducibility of sampling technique, matrix homogeneity, and analytical method. An RPD value of <30% is considered acceptable for drinking water and an RPD value of <50% is considered acceptable for soil.

RPD calculated between original and duplicate groundwater samples are provided in Table 1 and are within the acceptance criteria. RPD could only be calculated for PFOA in the TP-3/TP-DUP soil sample pair since PFOA was the only analyte detected in the duplicate. RPD for PFOA was 104% (Table 2), which is outside the acceptance criteria for soil samples. This may be due to soil heterogeneity and/or incomplete mixing of the sample prior to splitting into two sample containers. Weston & Sampson is of the opinion that the PFOA soil data is suitably precise to support the conclusions of this report.

4.2.2 Accuracy

Accuracy is the degree of measurement with an accepted reference or true value. Weston & Sampson evaluated accuracy by reviewing surrogate results, laboratory control sample results, and calibration QC results. For several PFAS compounds, fortified blank/laboratory control sample recovery, surrogate

recoveries or matrix spikes were outside of control limits. The results for these compounds may have been biased low or high. Other than PFOA and PFHxS in drinking water, the affected analytes are not considered compounds of concern for the Site or were not detected above reporting limits. Weston & Sampson is of the opinion that the PFOA and PFHxS data are suitably accurate to support the conclusions of this report.

4.2.3 Representativeness

Representativeness expresses the degree to which data accurately and precisely represent a characteristic of the population, parameter variation, or environmental condition. Weston & Sampson designed the sampling protocol to ensure representativeness by incorporating factors such as Site history, visual and olfactory observations, physical features, proper sample collection and preservation procedures, appropriate testing methodology, and field screening data. The samples collected at the Site are considered representative based on the known conditions and potential contaminant release mechanisms.

4.2.4 Completeness

Completeness is a measure of whether enough data has been collected to support a regulatory opinion and is expressed as a percentage representing the ratio of valid data to expected data. Data may be considered invalid for reasons such as exceeding the holding time, poor calibration of analytical instruments, and poor surrogate or matrix spike recoveries. Based on a review of the case narratives and lab QA/QC samples, the data collected for this Site are complete.

4.2.5 Comparability

Comparability refers to the level of confidence with the correlation of data collected during separate events or by different persons or analyzed by different methods. This may be measured qualitatively based on a review of sampling and testing procedures or quantitatively by comparison of sample data collected at the same location using the same sampling and testing procedures. All sampling and testing procedures were followed utilizing accepted standards for quality assurance and quality control and are expected to be comparable to any future data collected at the Site.

4.2.6 Sensitivity

Sensitivity is a measure of whether the laboratory method was sufficient to report detected contaminants at concentrations at or below the applicable regulatory criteria. All laboratory reporting limits were below their corresponding MCL or VSS.

5.0 CONCEPTUAL SITE MODEL

The following conceptual site model (CSM) has been developed for the Site and is based on Site Investigation results and an extensive PFAS investigation completed in 2016-2017 for Pownal Village, North Pownal, and Pownal Center areas of interest (Weston & Sampson, 2017). The CSM presents our understanding of the potential release mechanisms and processes controlling the fate and transport of PFAS at the Site and identified in the areas of interest listed above.

5.1 Site Description

The Site is in a rural residential and agricultural area of Pownal, Vermont. First known development of the Site was the construction of a residential dwelling beginning in 2022. Prior to development, the Site appears to be forested in aerial imagery dating back to 1985. According to the property owner, the Site and surrounding area has historically been in rural agricultural and residential uses. The Site is served by the on-site water supply and wastewater disposal infrastructure. The house is located centrally on the property. The water supply is a drilled bedrock well located approximately 150 feet east of the house. The wastewater disposal system consists of a concrete septic tank and leach field located to the north of the residence.

The central part of the Site is situated at approximately 754 feet above mean sea level. Site topography slopes gently to the north and southeast and steeply to the west from the central area of the Site. The Site is located on the eastern flank of the Hoosic River valley between the Green and Hoosic Mountains and the Taconic Mountains. The eastern flank of the valley is dominated by exposed bedrock to the top of a scarp. Bedrock scarps are located approximately 0.10-mile east, 0.15-mile north, 0.25-mile southwest, and 0.35-mile west of the Site. A thin veneer of till is expected to overlie bedrock at the Site.

During a Site visit on August 22, 2023, the Site owner, Mr. O'Neil, reported that approximately 4,000 cubic yards of fill was recently imported to the Site during construction of the residence. Mr. O'Neil indicates that bedrock was encountered during Site development requiring jackhammering to install the residence basement on a level surface. The imported fill was utilized to raise grades surrounding the residence basement.

According to Mr. O'Neil, approximately 1,000 cubic yards was imported by a local excavation company, Bisson Excavating, Inc. (Bisson Excavating), and had evidence of fill materials, including brick. This material was reportedly used to backfill around the foundation and the water line between the drilled well and the residence. Mr. Bisson indicated that the fill was bank run gravel excavated from a gravel pit located west of Route 346 in Pownal but did not indicate the exact location of the pit.

The remaining approximately 3,000 cubic yards of imported fill was reportedly sourced from a construction project at the Old Williams Inn located at 101 Spring Street in Williamstown, Massachusetts and appeared to consist of crushed stone, used for driveway construction materials, and bank run gravel. The Old Williams Inn property has a Release Tracking Number (RTN #1-0020390) related to the presence of total petroleum hydrocarbons and polycyclic aromatic hydrocarbons (PAHs) at concentrations exceeding Massachusetts regulatory standards. Bills of lading available on the Massachusetts Department of Environmental Protection (MassDEP) Energy & Environmental Affairs Data Portal indicate that approximately 8,100 tons of "urban fill" soils were transported to Ontario City Landfill in Stanley, NY and approximately 3,400 tons of soil were transported to New England Waste Services VT landfill in Coventry, Vermont between October, and December 2017. It is currently unknown if contaminant concentration data is available for the materials delivered to the O'Neil property.

The Site and nearby area are underlain by a complex series of folded and faulted bedrock formations of the Middlebury Synclinorium. Members of the Walloomsac, Bull and Bascom Formations are present and are composed of various types of shale, phyllite, dolostone and dolomitic limestone. The bedrock geologic map presented on Figure 4 shows the bedrock types, complex array of faults and fractures in the area, and PFOA and PFOS concentrations from bedrock water supplies sampled in 2016-2017 and 2023.

The O'Neil bedrock drinking water well (well tag #63504) was completed on August 24, 2022. The well log (Appendix E) indicates that the well was completed to 600 feet below grade, bedrock was encountered at 5 feet below grade, and 20 feet of steel casing was installed. Subsurface materials are described as till from ground surface to five feet below grade, white limestone from five feet to twenty feet below grade, and black and white limestone from twenty feet to six hundred feet. The static water level was measured at 300 feet on August 24, 2022, and yield was ½-gallon per minute. Other nearby water supplies impacted by PFAS exceeding the MCL are at 581 Quarry Hill Road, located approximately 400 feet south of the Site well, and 871 North Pownal Road, located approximately 725 feet northwest of the Site well. Both are bedrock wells with total depths of 310 and 160 feet below grade, respectively. Information for water supplies sampled as part of this Site Investigation, including year of installation, depth, tag number (if available), and latitude/longitude are provided in the Appendix B sampling summary.

The nearest surface water bodies to the Site include two unnamed streams located approximately 500-feet to the south and 650-feet to the west. Both streams are tributaries to the Hoosic River, which is located approximately 0.62-miles to the southwest.

Overburden groundwater flow directions at and near the Site are expected to be directly away from bedrock scarps as the hydraulic head from the bedrock above will dominate in this area. The unnamed streams to the west and south likely receive groundwater discharge from the Site and nearby area. Groundwater flow in bedrock will be controlled by the complex network of fractures and faults. The vertical component of the hydraulic gradient from unconsolidated overburden to bedrock is unknown at the Site but anticipated to be vertically downward.

5.2 Compounds of Concern

The Site contaminants of concern are PFAS, primarily perfluorooctanoic acid (PFOA). PFAS are class of fluorochemicals manufactured for their unique chemical stability and surface-tension lowering properties. Following several decades of commercial use, PFAS have been discovered to be globally distributed, persistent environmental contaminants. Evidence of in vivo toxicity, and the occurrence of PFAS in the blood of general populations, has created public health concern.

PFOA was used to manufacture products that resist heat and chemical reactions, and repel oil, stains, grease, and water. PFAS are used as an aqueous dispersant agent for Gore-Tex®, Teflon® and stain resistant coating of materials. PFOA has also been utilized for coatings applications on fabrics, wire, glass, and plastics. The carbon fluoride bonds in these long chain compounds are the strongest in nature. As such, PFAS are extremely resistant to chemical and biologic degradation. PFAS are also formed through the abiotic and biotic degradation of fluorotelomer alcohols.

PFOA is a solid that is extremely water soluble and bonds weakly with organic carbon. Adsorption to clay and iron minerals of the soil skeleton is also reported at suitable pH. Overall, PFAS sorption capacity of non-carbon rich soils are minimal. As indicated by SPLP extract concentrations, Site soils reporting

low concentrations of PFAS via standard EPA 537 analyses yielded SPLP extract concentrations of PFAS above Vermont's 20 ppt MCL and Groundwater Enforcement Standard (VGES).

For fate and transport in the environment analyses, the majority of fully fluorinated PFAS, including PFOA, are considered completely stable and flow nearly unimpeded with advective groundwater flow. This resiliency has led to the presence of PFAS throughout water globally.

PFOA is considered a potential carcinogen and bioaccumulates in the blood serum of humans. Inhalation of dusts and ingestion of contaminated water and food are the primary exposure routes to humans. Accumulation in the liver, kidneys, and blood serum occur. Increased incidents of testicular and bladder cancers are also reported. After ceasing exposure, the PFAS are slowly excreted without being degraded.

5.3 Potential Sources, Distribution, and Migration Pathways

PFAS investigations completed in Pownal in 2016 and 2017 included analysis of 138 private drinking water supplies by Weston & Sampson and 16 additional water supplies by United States Environmental Protection Agency (EPA) contractors. Water supplies sampled were selected based on their proximity to either the former Warren Wire/General Cable Facility, the former Warren Wire Plant #3, the Pownal Tannery Superfund Site, the former Barlow Gravel Pit/Town Dump Site, or the former Dodge Farm Dump Site (Figure 2). The uses and potential release mechanisms for each are discussed in the following sections.

PFAS appears to be leaching into groundwater from native soil located near the Site water supply well. The source and extent of PFAS in native soil is unknown but may be from aerial deposition, mishandling of PFAS contaminated materials related to known PFAS sources in Pownal, or another unknown source. Known PFAS sources in Pownal are discussed in detail below including whether the source is likely contributing to PFAS concentrations at the Site and nearby water supplies.

We expect that aerial deposition would result in more widespread contamination of water supplies in Pownal than observed during this and previous PFAS investigations. Therefore, aerial deposition is an unlikely source of PFAS observed in the Site and nearby water supplies. The Site was formerly part of the former Dodge Farm, which has documented on site disposal of PFAS containing products. PFAS may also be leaching from fill soils recently imported to the Site from a local gravel pit and a construction site in Williamstown, Massachusetts. However, PFAS concentrations of fill soil leachate is much lower than native soil located closer to the Site water supply well. PFAS leaching from soil into groundwater likely enters bedrock, the top of which is five feet below grade at the Site well and flows through fractures that are hydraulically connected to the impacted drilled bedrock wells. Removal of groundwater from the normal operation of the residential water supplies will influence groundwater flow within the fractures, generally increasing the hydraulic gradient towards the well and drawing in additional PFAS contaminated groundwater.

Point of entry treatment (POET) systems have been installed at 581 Quarry Hill Road, 583 Quarry Hill Road, and 871 North Pownal Road to remove PFAS prior to residential use. While maintenance and monitoring of the POET systems is ongoing, initial results have indicated that they are effective at removing PFAS from drinking water. Monitoring results will be reported separately.

5.3.1 Former Dodge Farm Dump Site

The Dodge Farm at 549 Cedar Hill Road is located between the Warren Wire/General Cable facility and Pownal Center and was previously owned by the founder of Warren Wire. According to Town of Pownal Land Records, the Dodge Farm formerly included most of the property along Quarry Hill Road, including the Site. The current owners of 549 Cedar Hill Road indicate that they have found several dumping areas around the farm that contain "melted" wire bundles and other debris from the former wire manufacturing facility. PFAS are likely present in this debris and may be leaching into soils and groundwater. Three wells were sampled at the property. The bedrock water supply wells for the house and barn were free of PFAS contamination. However, the shallow irrigation well at the southwest corner of the property contained 7.72 ppt PFOA. No evidence of dumping was observed at the Site.

5.3.2 Former Warren Wire Plant #3

Warren Wire/General Cable operated a small facility on Center Street in Pownal Center referred to as the "Teflon Shop." Actual activities performed at the facility are unknown. The building was removed in the early 1970s and only a concrete pad remains. Investigation of soil and groundwater conditions revealed PFAS in surface water, soils, and shallow groundwater. PFOA was detected in shallow groundwater at concentrations of 320 ppt. Surface water from the wetlands on site also reported a PFOA concentration of 22 ppt. No other PFAS was detected above laboratory reporting limits in groundwater or surface water. The wetlands do not appear to have an active outflow, potentially resulting in continual infiltration of contaminated waters into the underlying till and bedrock. Bedrock water supply wells in the area immediately surrounding Plant #3 did not contain quantifiable concentrations of PFAS during the 2016-2017 investigation.

The former Warren Wire Plant #3 is located approximately 1.5-miles east-southeast of the Site at a higher elevation and is potentially positioned hydraulically upgradient of the Site and could be serving as a source of PFAS observed in the Site well. This would require a hydraulic connection between bedrock fractures where PFAS is potentially entering bedrock at the former Warren Wire Plant #3 property to fractures connected to the Site water supply. Well depths at 1187 North Pownal Road (300 feet) and 1522 North Pownal Road (200 feet) located between the Former Warren Wire #3 Plant and the Site are much shallower than the Site well (600 feet) and may not be hydraulically connected to the former plant or the Site. However, PFOA was the only PFAS compound detected in Warren Wire Plant #3 groundwater while Site and nearby drinking water supplies contain several other PFAS compounds (PFBA, PFBS, PFHpS, PFPeA, PFHxA, PFHpA, and PFOS). This significant difference in PFAS composition suggests that Warren Wire Plant #3 is not the source of PFAS observed at the Site and nearby water supplies.

5.3.3 Pownal Tannery Site

The Pownal Tannery site is the location of a former hide tanning and finishing facility located south of the village center of North Pownal on the east side of the Hoosic River adjacent to the dam. This facility operated from the early 1930s until 1988. Although no indication of PFAS use has been reported at the Pownal Tannery specifically, PFAS have been used in the leather tanning and treatment industry. If PFAS were part of the leather treatment processes at the Pownal Tannery, it could have been released into the environment in the following manner:

- Atmospheric discharge from drying ovens
- Mishandling and/or dumping at the mill building
- Wastewater discharge and infiltration at the former lagoon systems
- Leaching from lagoon sludges landfilled on Dean Road

- Leaching from leather scraps landfilled at the former Barlow gravel pit "Town Dump" site.
- Use of odor controlling foams during lagoon sludge excavation and landfilling. Odor controlling foams are known to contain PFAS in complex formulations.

The Pownal Tannery site is located approximately 0.80-miles southwest of the Site at a lower elevation within the Hoosic River valley. PFAS contaminants in this area are present in both overburden and bedrock water supply and monitoring wells and primarily include PFOA, PFOS, perfluoroheptanoic acid (PFHpA), and PFHxS. Site PFAS contaminants are dominated by PFOA, PFHpA, PFBS, and to a lesser extent PFOS. Multi-variate plots for the Site well and Pownal Tannery groundwater monitoring wells are provided as Appendix F for comparison. Airborne deposition of PFAS discharged to the atmosphere would be the most likely method for the Pownal Tannery to be a source of PFAS at the Site. However, widespread PFAS contamination would be expected in water supply wells near the former tannery site if aerial deposition was the primary release mechanism.

5.3.4 Former Barlow Gravel Pit/Town Dump Site

The former Town Dump site is located approximately 1,200 feet west of the Former Pownal Tannery sludge landfill. A small (1.5 acre) solid waste landfill operated at this site for several years in the 1960s and 1970s. The landfill received tannery wastes along with domestic solid waste from nearby residences. PFAS are leaching from this area. The Vermont Environmental Research Tool indicates that this site (SMS #20063537) is still under investigation for PFAS. The Former Barlow Gravel Pit/Town Dump site is at a lower elevation and likely hydraulically isolated from the Site by the Hoosic River. The primary release mechanism is discharge of landfill leachate to the subsurface. The Former Barlow Gravel Pit/Town dump is not a potential source of PFAS at the O'Neil property.

5.3.5 Former Warren Wire/General Cable

The Warren Wire/General Cable facility is a known user of PFAS. The Warren Wire/General Cable facility was constructed in the late 1940s. the Warren Wire/General Cable facility produced Teflon™-coated wires for high temperature applications beginning in the 1950s. In 1963 the facility was sold to the General Cable Company (General Cable), who also produced Teflon™-coated wire. Manufacturing continued at the facility until 1986. The Teflon™ coating process used by Warren Wire/General Cable included the use of PFAS. Potential PFAS release sources from the Warren Wire/General Cable facility include:

- Unicorn Management Consultants, LLC (UMC) Remedial Investigation Report (RIR) indicates that the facility stored large volumes of materials in above ground storage tanks and silos throughout the property. Materials handling and transfer could result in releases to the ground surface and/or storm water collection system.
- Atmospheric discharge from drying and sintering ovens which heated and set the Teflon™ coating to the substrate materials. This process is known to drive PFAS off the substrate into the air discharged through stacks. No treatment devices are reported to have been in place at the Warren Wire/General Cable plant. Atmospheric transport of PFAS as particulate and dissolved in water vapor has been documented to result in ground surface deposition along prevailing wind directions miles from the release point.
- "Stack Fires" are reported to have occurred. Overheating and combustion of Teflon™ will release PFAS to the atmosphere.
- PFAS contaminated materials are reported as still present in floor drains suspected of discharging directly to the Hoosic River. Perfluorooctanoic acid PFOA, PFOS and

several additional PFAS were shown to readily leach from these materials. Releases to the floor drains result in PFAS discharge to the Hoosic River.

The former Warren Wire/General Cable facility is located at 1007 Route 346 in Pownal, Vermont, which is approximately 1.75-miles south of the Site at a lower elevation within the Hoosic River Valley. Bisson Excavating is located at 1235 Route 346, adjoining the former Warren Wire/General Cable facility to the north and is one of the ten private water supplies that were equipped with POET systems due to PFAS impacts. Releases of PFAS, almost exclusively PFOA, has resulted in impacts to a public water supply (Pownal Fire District #2) and several nearby water supply wells (overburden and bedrock). The extent of soil, shallow groundwater and bedrock aquifer contamination resulting from the releases at the 1007 Route 346 Warren Wire/General Cable facility are not fully defined but are unlikely to extend to the Site unless related to airborne PFAS transport. As previously indicated, more widespread PFAS contamination in water supplies would be expected if aerial deposition were the primary release mechanism of PFAS. The absence of PFAS compounds, other than PFOA, common at the Site is also evidence that the Warren Wire/General Cable site is likely not a source of PFAS to Site drinking water.

5.4 Sensitive Receptors

A Sensitive Receptor map, generated with the Vermont Agency of Natural Resources (ANR) Atlas, is provided as Figure 7. The Site is in a rural residential and agricultural area of Pownal, Vermont. The Site and nearby properties are served by private water supplies and on-site wastewater disposal infrastructure. Human receptors include residential occupants of the Site and other properties with impacted water supplies and soil. Livestock may be exposed through the consumption of grass that has taken up PFAS through contaminated soil or the consumption of contaminated groundwater or surface water. If PFAS contaminated groundwater discharges to the unnamed streams near the Site, users of these steams could be affected. Wetlands are mapped near the unnamed streams. Potential ecological receptors include aquatic biota of the streams and wetlands.

5.5 Exposure Pathways

Potential exposure pathways to sensitive receptors include direct contact through ingestion or dermal contact with contaminated groundwater, soil, and/or surface water.

The following exposure pathways are complete:

- Site users and users of nearby water supplies can encounter PFAS contaminated groundwater through ingestion and dermal contact with bedrock water supply well sourced waters. This pathway has been mitigated at impacted properties through the installation and operation of POET systems.
- Site users can encounter airborne PFAS through inhalation of mists or aerosols created by use of the contaminated water supply. This pathway has been mitigated at impacted properties through the installation and operation of POET systems.
- Site users can encounter PFAS through ingestion and dermal contact with PFAS contaminated soil.

The following exposure pathways may be complete, but their status is currently unknown:

- Users of off-Site bedrock water supply well sourced waters to the northwest may encounter PFAS through ingestion and dermal contact.

- Site users and livestock may encounter PFAS through ingestion of food grown or raised on PFAS contaminated soil.
- Site users and livestock may encounter PFAS through direct contact and ingestion of surface water in unnamed streams that may receive discharge of contaminated groundwater.

The following table summarizes the potentially impacted media, sensitive receptors, and whether each exposure pathway is considered complete, incomplete, or is currently unknown.

Media	Contaminants of Concern	Sensitive Receptors	Exposure Pathways	Exposure Pathway Complete?
Surface Soil	PFAS	Site Users	Direct Contact, Ingestion	Complete
		Livestock	Direct Contact, Ingestion	Complete
Subsurface Soil	PFAS	Future Site Users (construction/utility workers)	Direct Contact, Ingestion	Complete
Groundwater	PFAS	Site Users	Direct Contact, Ingestion, Inhalation	Complete
		Off-Site Users to northwest	Direct Contact, Ingestion, Inhalation	Unknown
Surface Water	PFAS	Users of Unnamed Streams	Direct Contact, Ingestion	Unknown
		Aquatic Biota in Unnamed Streams	Direct Contact, Ingestion	Unknown

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6.0 DISCUSSION AND CONCLUSIONS

Weston & Sampson has completed a PFAS Site Investigation for the property located at 583 Quarry Hill Road in Pownal, Vermont (the Site). The findings of the Site investigation include the following:

- Three (3) of the ten (10) residential water supplies sampled as part of this Site Investigation have concentrations of the five (5) regulated PFAS compounds exceeding the Vermont Maximum Contaminant Level (MCL) for drinking water of 20 parts per trillion (ppt). The primary PFAS compound detected in water supplies is perfluorooctanoic acid (PFOA) but also includes notable detections of perfluorobutanoic acid (PFBA), perfluorobutanesulfonic acid (PFBS), perfluoropentanoic acid (PFPeA), perfluorohexanoic acid (PFHxA), perfluoroheptanoic acid (PFHpA), and perfluorooctanesulfonic acid (PFOS). Point of entry treatment (POET) systems have been installed at these residences to mitigate the exposure of PFAS through ingestion.

- Three (3) water supplies have PFAS concentrations detected below the MCL. The extent of PFAS in residential drinking water supplies relative to the Site has not been defined to the northwest.

- PFAS, primarily PFOA, appears to be leaching from native soil at the Site into groundwater then migrating into the impacted drinking water supplies through hydraulically connected bedrock fractures. The source of PFAS in native soil is unknown but may include, in order of likelihood:

    - Disposal of PFAS containing materials from the former Warren Wire/General Cable facility at the Site and/or nearby properties when this area was part of the Dodge Farm.
    - Use of PFAS containing fill materials during development of the Site as a single-family residence. Fill soil imported to the Site from the Bisson Excavating gravel pit in Pownal and the Old Williams Inn construction site in Williamstown, Massachusetts could be contributing PFAS to groundwater contamination. However, leachate from these soils does not result in dissolved PFAS concentrations that would result in MCL exceedances.
    - Discharge from in-ground wastewater disposal systems at or nearby the Site.
    - Aerial deposition from nearby known PFAS sources including the Former Warren Wire/General Cable facility and the former Pownal Tannery.
    - Migration of PFOA contaminated groundwater from the former Warren Wire Plant #3

6.1 Data Gaps

The following data gaps have been identified that require additional assessment:

- The nature and extent of PFAS in bedrock water supply wells is not fully defined. Additional water supply sampling should be performed to the northwest of the Site.

- The nature and extent of PFAS in native soil that may be contributing to drinking water MCL exceedances is unknown.

- It is unknown if PFAS contaminated groundwater discharges to unnamed streams and whether there is potential exposure to Site users and livestock through direct contact and/or ingestion of surface water.

7.0 RECOMMENDATIONS

Based on the findings of the Site Investigation, Weston & Sampson makes the following recommendations:

- Interviews should be conducted with area residents who have been living in the area for multiple decades to establish past land use practices at the Site and nearby properties, including the former Dodge Farm.

- Additional water supply well sampling from properties to the northwest and west of the Site to further evaluate the extent of PFAS in bedrock groundwater. We recommend sampling water supplies at the addresses listed below. We recommend sampling up to five water supplies that were sampled for PFAS in 2016 and located west of the Site to further evaluate PFAS composition, source, and temporal trends. Previous PFAS results are summarized in paratheses next to proposed resample locations, below.
    - 716 North Pownal Road (access previously denied – recommend that VTDEC contact to discuss results of this Site Investigation and request sampling)
    - 393 North Pownal Road
    - 372 North Pownal Road
    - 369 North Pownal Road
    - 326 North Pownal Road
    - 286 North Pownal Road
    - 225 North Pownal Road (Non-detect for PFAS on 6/23/2016)
    - 191 North Pownal Road
    - 3138 Route 346 (Non-detect for PFAS on 6/8/2016 – adjacent to two properties with POET systems)
    - 3239 Route 346 (24.08 ng/l for sum of PFOA and PFOS on 11/10/2016)
    - 3437 Route 346 (8.6 ng/l of PFOA on 4/27/2016)
    - 3503 Route 346 (7.77 ng/l of PFOA on 6/9/2016)

- Additional soil assessment at the Site and surrounding properties should be completed to further evaluate the nature and extent of PFAS in soil.
    - Depth discrete soil samples should be collected from four soil borings advanced near the Site water supply and within fill materials near the residence. Up to three soil samples should be collected from each boring that represent surface soil (0-18 inches), fill materials, and native soil underlying fill/overlying bedrock.
    - Depth discrete soil samples should be collected from ten grid-based locations in undisturbed areas of the Site including east of the water supply and west of the residence, from the agricultural field located west of the Site (581 Quarry Hill Road), and throughout the 871 North Pownal Road property to evaluate “background” PFAS concentrations in soil. Two soil samples should be collected at each location including surface soil (0-18 inches) and underlying native soil at depths up to 3 feet below grade.
    - A subset of the soil samples described above should undergo SPLP extraction and PFAS analysis to evaluate leachability of PFAS from soil to groundwater.
    - If access is granted, soil samples should be collected from Bisson gravel pit and Old Williams Inn sites for PFAS analysis to evaluate soil quality at the source of fill materials.

- Surface water should be sampled from the two unnamed streams located to the west and south of the Site to determine if there is a risk of exposure to PFAS through contact and/or ingestion

of surface water. Surface water samples should be collected from near seeps, if possible. The stream located west of the Site is on a property where access was previously denied (716 North Pownal Road) and may need to be sampled from the culvert outfall within the North Pownal Road right-of-way.

If following completion of the tasks described above, the Warren Wire Plant #3 is still considered a potential source we recommend completing borehole geophysics of several water supplies between the Site and Plat #3 to determine the relationship between the geophysical setting of the Site, Plant #3, and the distribution of PFAS in drinking water supplies. Recommended geophysical tools include gamma logging to identify different lithologies, acoustical bore hole imaging and caliper logging to identify fracture orientation and aperture, and a heat pulse flow meter, temperature, and specific conductance to evaluate groundwater flow within boreholes.

Additional groundwater assessment is recommended as a separate investigation to define the nature and extent of PFOA in groundwater released from the former Warren Wire Plant #3.The groundwater assessment should include sampling nearby drinking water supplies located on Burlington Road, Route 346, Lincoln Street, and Palmer Drive and expansion/sampling of the groundwater monitoring well network at the plant. No further investigation is recommended currently regarding the potential aerial deposition of PFAS from known sources in Pownal. This release mechanism and migration pathway appears unlikely based on the absence of widespread PFAS contamination in area water supplies and differences in PFAS composition between the Site and other known sources.

8.0 SIGNATURE OF ENVIRONMENTAL PROFESSIONAL

This report was prepared by the following individuals:

Lee Rosberg
Senior Project Manager

I certify under penalty of perjury that I am an environmental professional and that all content contained within this deliverable is to the best of my knowledge true and correct.

Steven LaRosa
Technical Leader

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9.0 LIMITATIONS

This Site Investigation was prepared exclusively for the use of the Vermont Department of Environmental Conservation (VTDEC). The conclusions provided by Weston & Sampson in this report are based solely on the information reported in this document. Future investigations, and/or information that were not available to Weston & Sampson at the time of this investigation may result in a modification of the conclusions stated in this report.

Should additional information become available concerning this Site or neighboring properties that could directly impact the Site in the future; that information should be made available to Weston & Sampson for review so, if necessary, conclusions presented in this report may be modified. The conclusions of this report are based on Site conditions observed by Weston & Sampson personnel at the time of the investigation, information provided by the users and information provided by federal, state, and local agencies. This report has been prepared in general accordance with accepted engineering and environmental assessment practices. No other warranty, expressed or implied, is made.

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10.0 REFERENCES

ETR Laboratories Water and Environmental Testing, March 16, 2023. Laboratory Analytical Report #316231179 Prepared for Frost, Inc., 85 Frost Road, East Dorset, Vermont 05253.

Vermont Agency of Natural Resources, March 17, 2020. Environmental Protection Rules, Chapter 21, Water Supply Rule.

Weston & Sampson Engineers, Inc., September 2017. PFAS Summary Report, Pownal, Vermont, Prepared for the Vermont Department of Environmental Conservation.

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FIGURES

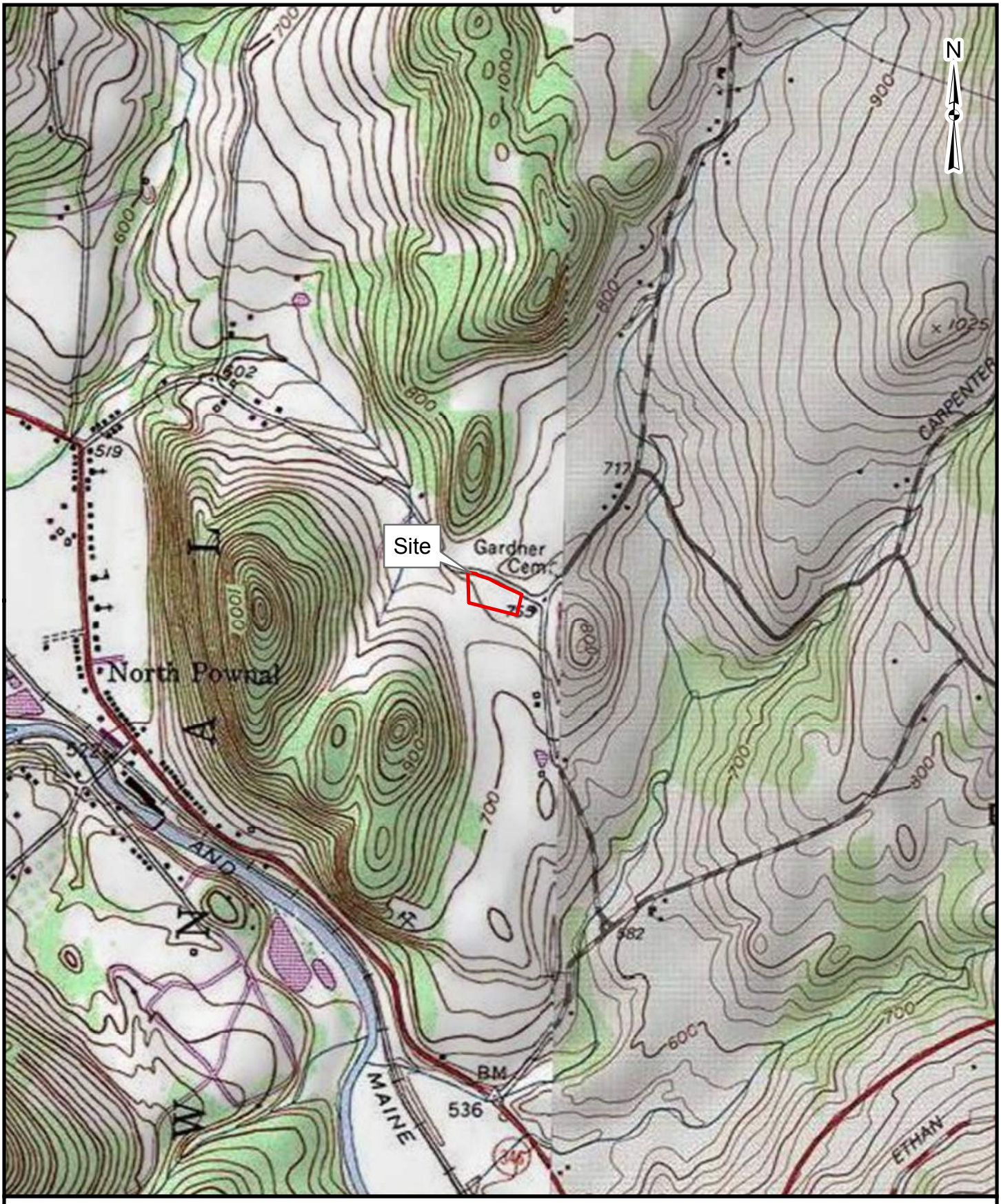

FIGURE 1
LOCUS MAP
583 QUARRY HILL ROAD, POWNAL, VT

1 in = 1,250 ft

Weston & Sampson

737 MOUNT ANTHONY ROAD
717 N. POWNAL ROAD
1187 N. POWNAL ROAD
871 N. POWNAL ROAD
583 QUARRY HILL ROAD
1557 N. POWNAL ROAD
1522 N. POWNAL ROAD
581 QUARRY HILL ROAD
990 N. POWNAL ROAD
431 QUARRY HILL ROAD
350 QUARRY HILL ROAD
320 QUARRY HILL ROAD

N

Legend

- Site Boundary
- Sample Locations (E911)
- Permission to Sample Not Granted
- Bisson Excavating Gravel Pit
- Dodge Farm
- Former Tannery Sludge Landfill
- Former Tannery Sludge Lagoon
- Former Town Dump
- Warren Wire Plant
- Warren Wire Plant #3

2,000 0 2,000
Scale In Feet

FIGURE 2

583 QUARRY HILL ROAD
POWNAL, VT

SITE MAP

DECEMBER, 2023 SCALE: NOTED

Weston & Sampson

Path: \\wse03.local\WSE\Projects\VT\VTDEC 2015-2016\Pownal\3 Drawings\GIS\Site Plan\Site Plan.aprx Map: Site Plan User: Haley.Sophia Saved: 2/21/2024 10:44 AM Opened: 2/21/2024 10:44 AM

N

Legend

- Site Boundary
- Bisson Excavating Gravel Pit
- Dodge Farm
- Former Tannery Sludge Landfill
- Former Tannery Sludge Lagoon
- Former Town Dump
- Warren Wire Plant
- Warren Wire Plant #3
- Public Water Account
- E911 Sites
- FD#2 Well#1
- Legend Space

PFOA + PFOS Summed Concentrations (ppt)

- < 20 ppt
- 20-70 ppt
- > 70 ppt

VT 5 PFAS Summed Concentrations (ng/L)

- Non Detected
- < 20 ng/L
- > 20 ng/L
- Permission to Sample Not Granted

The VT 5 PFAS compounds include PFHxS, PFHpA, PFOA, PFOS, and PFNA

1,800 0 1,800

Scale In Feet

FIGURE 3

583 QUARRY HILL ROAD
POWNAL, VT

PFOA & PFOS CONCENTRATIONS IN ALL SUPPLY WELLS: 2016-2017 AND 2023

DECEMBER, 2023 SCALE: NOTED

Weston & Sampson

Path: \\wse03.local\WSE\Projects\VT\VTDEC 2015-2016\Powtail3 Drawings\GIS\Site Plan\Site Plan.aprx **Map:** PFOA and PFOS **User:** Haley.Sophia **Saved:** 2/21/2024 10:13 AM **Opened:** 2/21/2024 10:14 AM

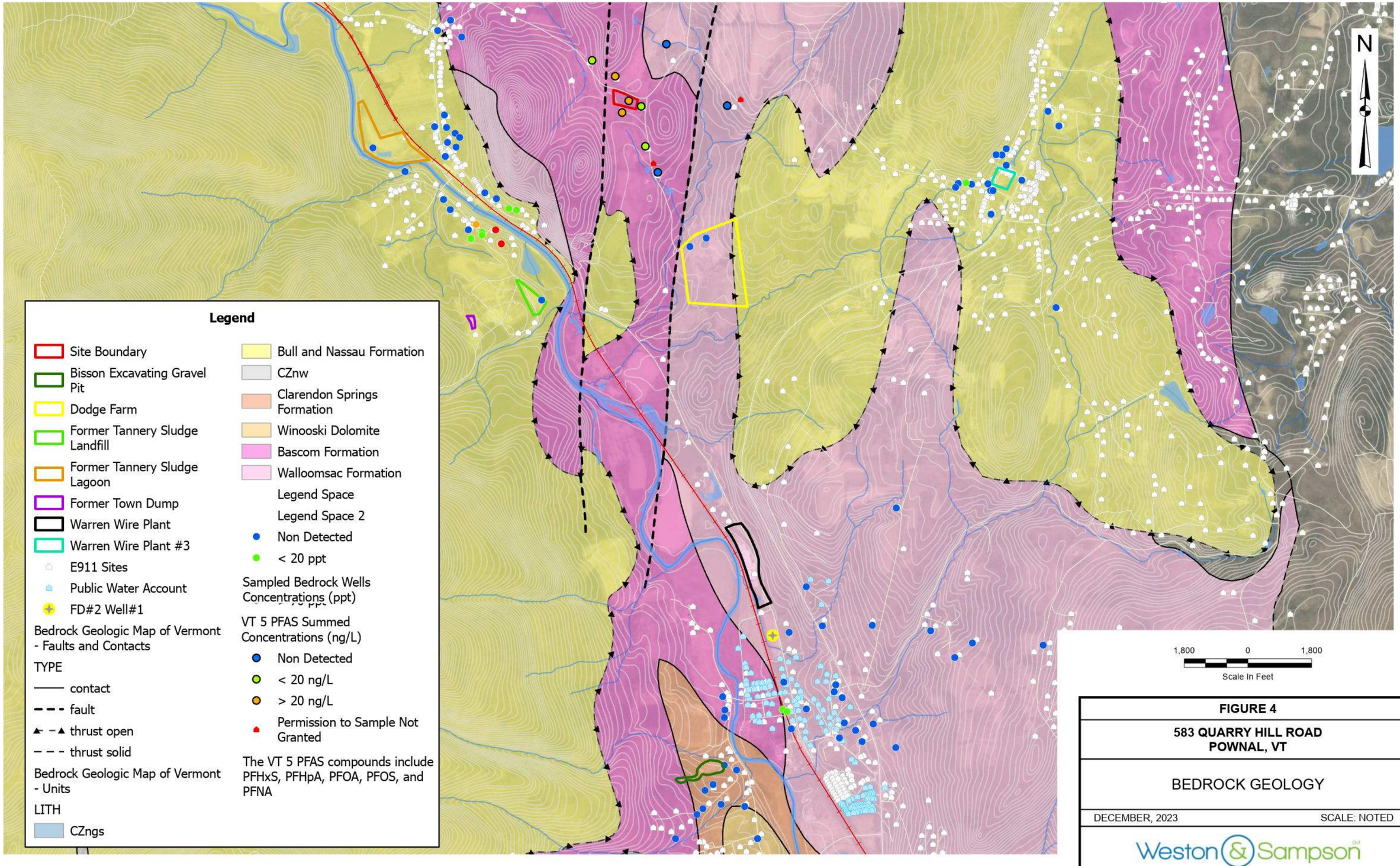

FIGURE 4

583 QUARRY HILL ROAD
POWNAL, VT

BEDROCK GEOLOGY

DECEMBER, 2023 SCALE: NOTED

Weston & Sampson

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737 MOUNT ANTHONY ROAD

1187 N. POWNAL ROAD

717 N. POWNAL ROAD

871 N. POWNAL ROAD

583 QUARRY HILL ROAD

581 QUARRY HILL ROAD

990 N. POWNAL ROAD

1557 N. POWNAL ROAD

1522 N. POWNAL ROAD

431 QUARRY HILL ROAD

350 QUARRY HILL ROAD

320 QUARRY HILL ROAD

N

Legend

- Site Boundary
- VT 5 PFAS Summed Concentrations (ng/L)
  - NOT DETECTED
  - < 20
  - > 20

NOTE: All results reported in nanograms per liter (ng/L)

The VT 5 PFAS compounds include PFHxS, PFHpA, PFOA, PFOS, and PFNA

- Permission to Sample Not Granted

2,000 0 2,000

Scale In Feet

FIGURE 5

583 QUARRY HILL ROAD
POWNAL, VT

PFAS DRINKING WATER RESULTS

DECEMBER, 2023 SCALE: NOTED

Weston & Sampson

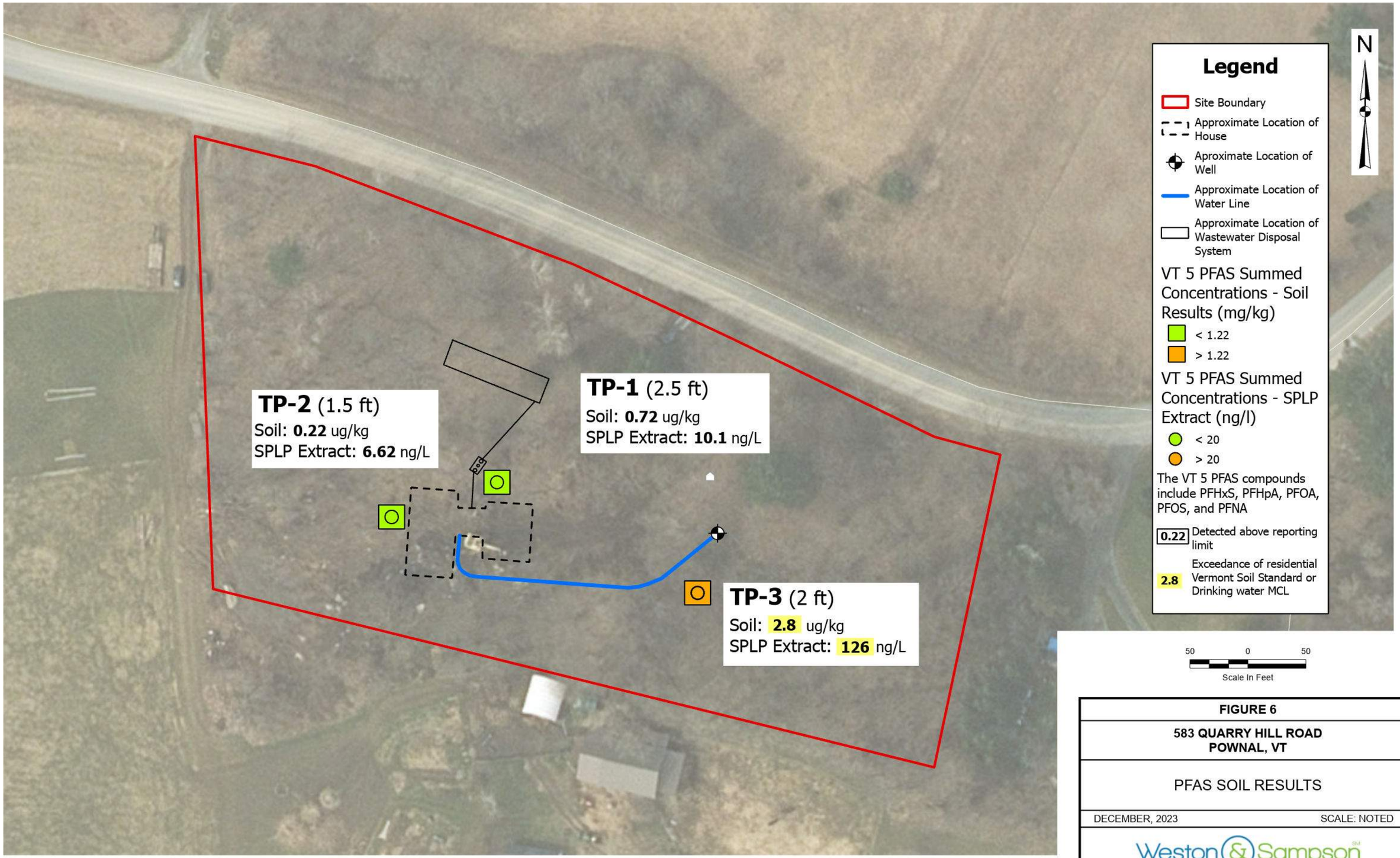

FIGURE 6

583 QUARRY HILL ROAD
POWNAL, VT

PFAS SOIL RESULTS

DECEMBER, 2023 SCALE: NOTED

Weston & Sampson

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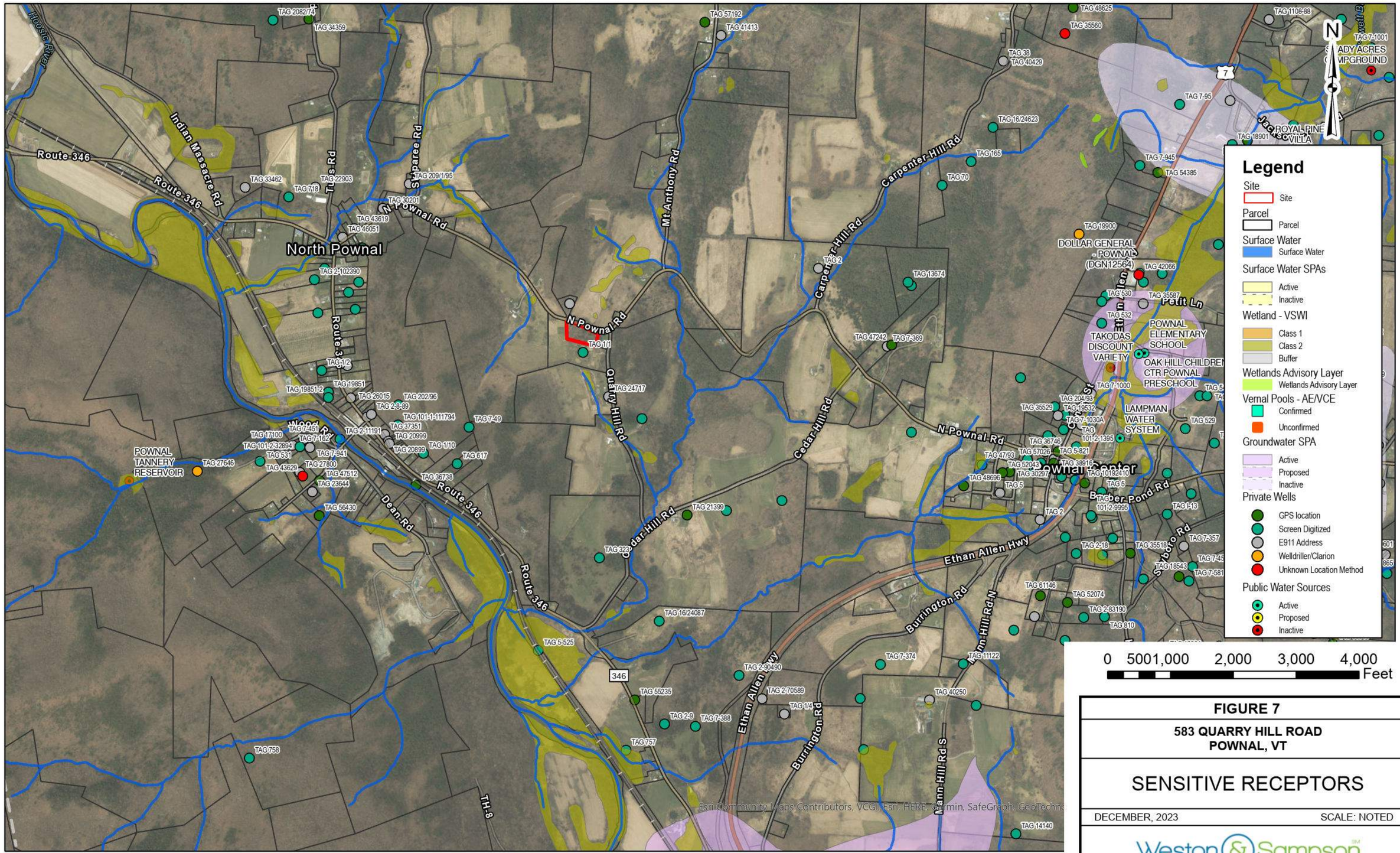

FIGURE 7

583 QUARRY HILL ROAD
POWNAL, VT

SENSITIVE RECEPTORS

DECEMBER, 2023 SCALE: NOTED

Weston & Sampson

TABLES

TABLE 1
POWNAL PRIVATE WATER SUPPLY – PFAS ASSESSMENT
PFAS CONCENTRATION SUMMARY

Parameter	Units	VT MCL	737 MOUNT ANTHONY ROAD		717 NORTH POWNAL ROAD		871 NORTH POWNAL ROAD		871 NORTH POWNAL ROAD		871 NORTH POWNAL ROAD (DUP)		RPD	990 NORTH POWNAL ROAD		1187 NORTH POWNAL ROAD		1522 NORTH POWNAL ROAD		320 QUARRY HILL ROAD	
			9/14/2023		9/14/2023		9/13/2023		10/30/2023		10/30/2023			9/13/2023		10/4/2023		9/13/2023		9/14/2023	
			Result	Flag	Result	Flag	Result	Flag	Result	Flag	Result	Flag		Result	Flag	Result	Flag	Result	Flag	Result	Flag
533																					
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Perfluorobutanoic acid (PFBA)	ng/l		1.8	U	1.77	U	1.85	U	**1.03**	J	**0.961**	J	5%	1.84	U	1.81	U	1.88	U	1.81	U
Perfluorobutanesulfonic acid (PFBS)	ng/l		1.8	U	1.77	U	**8.72**		**3.24**		**2.97**		9%	1.84	U	1.81	U	1.88	U	1.81	U
Perfluoropentanoic acid (PFPeA)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Perfluoropentanesulfonic Acid (PFPeS)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Perfluorohexanoic acid (PFHxA)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Perfluorohexanesulfonic acid (PFHxS)	ng/l	20	1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Perfluoroheptanoic acid (PFHpA)	ng/l	20	1.8	U	1.77	U	1.85	U	**1.48**	J	**1.23**	J	18%	1.84	U	1.81	U	1.88	U	1.81	U
Perfluoroheptanesulfonic acid (PFHpS)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Perfluorooctanoic acid (PFOA)	ng/l	20	1.8	U	**13.1**		**30.4**		**28.6**		**28.5**		0%	**11.7**		1.81	U	1.88	U	1.81	U
Perfluorooctanesulfonic acid (PFOS)	ng/l	20	1.8	U	1.77	U	1.85	U	**1.01**	J	**1.15**	J	13%	**2.33**		1.81	U	1.88	U	1.81	U
Perfluorononanoic acid (PFNA)	ng/l	20	1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Perfluorodecanoic acid (PFDA)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Perfluoroundecanoic acid (PFUnA)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Perfluorododecanoic acid (PFDoA)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ng/l		1.8	U	1.77	U	**2.06**		**0.896**	J	**1.02**	J	13%	1.84	U	1.81	U	1.88	U	1.81	U
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Perfluoro-3-methoxypropanoic acid (PFMPA)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Perfluoro-4-methoxybutanoic acid (PFMBA)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-P	ng/l		1.8	U	1.77	U	1.85	U	1.90	U	1.87	U	--	1.84	U	1.81	U	1.88	U	1.81	U
PFAS VT 5 (total)	ng/l	20	1.8	U, Y	**13.1**	Y	**30.4**	Y	**33.0**	Y	**32.8**	Y	1%	**14.0**	Y	1.81	U, Y	1.88	U, Y	1.81	U, Y

NOTES:

VT MCL	Vermont Water Supply Rule Maximum Contaminant Levels (Water Supply Rule; March 17, 2020)
PFAS VT 5 (total)	sum of PFHxS, PFHpA, PFNA, PFOS, PFOA
--	No comparison because analytes were not detected above laboratory reporting limits
RPD	Relative Percent Difference between the sample result and the blind field duplicate result
ng/L	nanograms per liter
U	not detected above laboratory reporting limit
Y	calculated value
E	result exceeded calibration range
J	estimated value less than the reporting limit, but greater than the method detection limit
Blank Cell	Not Analyzed
Bold	Cncentration above laboratory detection limit
Bold	Exceedance of VT MCL

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TABLE 1
POWNAL PRIVATE WATER SUPPLY – PFAS ASSESSMENT
PFAS CONCENTRATION SUMMARY

Parameter	Units	VT MCL	431 QUARRY HILL ROAD		581 QUARRY HILL ROAD		581 QUARRY HILL ROAD (DUP)		RPD	581 QUARRY HILL ROAD		583 QUARRY HILL ROAD		583 QUARRY HILL ROAD (DUP)		RPD	FIELD BLANK		FIELD BLANK		FIELD BLANK	
			9/13/2023		10/4/2023		10/4/2023			10/30/2023		9/13/2023		9/13/2023			9/13/2023		10/4/2023		10/30/2023	
			Result	Flag	Result	Flag	Result	Flag		Result	Flag	Result	Flag	Result	Flag		Result	Flag	Result	Flag	Result	Flag
533																						
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
Perfluorobutanoic acid (PFBA)	ng/l		1.85	U	**2.71**		**2.65**		2%	**3.24**		**30.7**		**28.9**		6%	1.85	U	1.87	U	1.95	U
Perfluorobutanesulfonic acid (PFBS)	ng/l		1.85	U	**1.86**		**1.92**		3%	**1.77**		**5.11**		**4.8**		6%	1.85	U	1.87	U	1.95	U
Perfluoropentanoic acid (PFPeA)	ng/l		1.85	U	**1.89**		**1.83**		3%	**2.29**		**11**		**12**		9%	1.85	U	1.87	U	1.95	U
Perfluoropentanesulfonic Acid (PFPeS)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
Perfluorohexanoic acid (PFHxA)	ng/l		1.85	U	**2.37**		**2.28**		4%	**2.81**		**13.9**		**13.6**		2%	1.85	U	1.87	U	1.95	U
Perfluorohexanesulfonic acid (PFHxS)	ng/l	20	1.85	U	**0.991**	J	**1.05**	J	6%	**0.949**	J	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
Perfluoroheptanoic acid (PFHpA)	ng/l	20	1.85	U	**2.1**		**1.97**		6%	**2.58**		**16.7**		**15.8**		5%	1.85	U	1.87	U	1.95	U
Perfluoroheptanesulfonic acid (PFHpS)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
Perfluorooctanoic acid (PFOA)	ng/l	20	**2.24**		**16.6**		**18.3**		10%	**19.9**		**161**		**154**		4%	1.85	U	1.87	U	1.95	U
Perfluorooctanesulfonic acid (PFOS)	ng/l	20	1.85	U	**6.95**		**6.76**		3%	**5.67**		**2.69**		1.78	U	--	1.85	U	1.87	U	1.95	U
Perfluorononanoic acid (PFNA)	ng/l	20	1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
Perfluorodecanoic acid (PFDA)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
Perfluoroundecanoic acid (PFUnA)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
Perfluorododecanoic acid (PFDoA)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ng/l		1.85	U	1.73	U	1.77	U	--	**1.99**		1.76	U	1.78	U	--	1.85	U	1.87	U	**1.22**	J
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
Perfluoro-3-methoxypropanoic acid (PFMPA)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
Perfluoro-4-methoxybutanoic acid (PFMBA)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
Nonafluoro-3,6-dioxaheptanoic acid (NFDHA)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
9-Chlorohexadecafluoro-3-oxanonane-1-sulfonic acid (9Cl-PF3O	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-P	ng/l		1.85	U	1.73	U	1.77	U	--	1.74	U	1.76	U	1.78	U	--	1.85	U	1.87	U	1.95	U
PFAS VT 5 (total)	ng/l	20	**2.24**	Y	**26.6**	Y	**28.1**	Y	5%	**29.1**	Y	**180**	Y	**170**	Y	6%	1.85	U, Y	1.87	U, Y	1.95	U, Y

NOTES:

VT MCL	Vermont Water
PFAS VT 5 (total)	sum of PFHxS,
--	No comparisor
RPD	Relative Percer
ng/L	nanograms pe
U	not detected al
Y	calculated valu
E	result exceede
J	estimated valu
Blank Cell	Not Analyzed
Bold	Cncentration a
Bold	Exceedance of

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TABLE 2
PFAS SOIL CONCENTRATION SUMMARY
QUARRY HILL ROAD

Parameter	Vermont Soil Standards		Units	TP-1		TP-2		TP-3		TP-DUP		RPD
				10/4/2023		10/4/2023		10/4/2023		10/4/2023		
	Resident	Non-Resident		Result	Flag	Result	Flag	Result	Flag	Result	Flag	
PFAS by Isotope Dilution												
Perfluorobutanoic acid (PFBA)			mg/kg	**0.000063**	U	0.000575	U	**0.000056**	J	0.000525	U	--
Perfluorobutanesulfonic acid (PFBS)			mg/kg	0.000298	U	0.000287	U	0.00029	U	0.000262	U	--
Perfluoropentanoic acid (PFPeA)			mg/kg	0.000597	U	0.000575	U	0.000579	U	0.000525	U	--
Perfluoropentanesulfonic Acid (PFPeS)			mg/kg	0.00119	U	0.00115	U	0.00116	U	0.00105	U	--
Perfluorohexanoic acid (PFHxA)			mg/kg	0.000597	U	0.000575	U	**0.000067**		0.000525	U	--
Perfluorohexanesulfonic acid (PFHxS)	1.22	14.36	mg/kg	0.000298	U	0.000287	U	0.00029	U	0.000262	U	--
Perfluoroheptanesulfonic acid (PFHpS)			mg/kg	0.000597	U	0.000575	U	0.000579	U	0.000525	U	--
Perfluoroheptanoic acid (PFHpA)	1.22	14.36	mg/kg	0.000298	U	0.000287	U	**0.000097**	J	0.000262	U	--
Perfluorooctanoic acid (PFOA)	1.22	14.36	mg/kg	**0.000281**		0.000287	U	**0.0028**		**0.000884**	F	104%
Perfluorooctanesulfonic acid (PFOS)	1.22	14.36	mg/kg	**0.000439**		**0.000224**	J	0.00029	U	0.000262	U	--
Perfluorononanoic acid (PFNA)	1.22	14.36	mg/kg	0.000298	U	0.000287	U	0.00029	U	0.000262	U	--
Perfluorononanesulfonic acid (PFNS)			mg/kg	0.00119	U	0.00115	U	0.00116	U	0.00105	U	--
Perfluorodecanoic acid (PFDA)			mg/kg	0.000298	U	0.000287	U	0.00029	U	0.000262	U	--
Perfluorodecanesulfonic acid (PFDS)			mg/kg	0.000597	U	0.000575	U	0.000579	U	0.000525	U	--
Perfluoroundecanoic acid (PFUnA)			mg/kg	0.000597	U	0.000575	U	0.000579	U	0.000525	U	--
Perfluorododecanoic acid (PFDoA)			mg/kg	0.000597	U	0.000575	U	0.000579	U	0.000525	U	--
Perfluorotridecanoic acid (PFTrDA)			mg/kg	0.000597	U	0.000575	U	0.000579	U	0.000525	U	--
Perfluorotetradecanoic Acid (PFTeDA)			mg/kg	0.000597	U	0.000575	U	0.000579	U	0.000525	U	--
Perfluorooctanesulfonamide (PFOSA)			mg/kg	0.000597	U	0.000575	U	0.000579	U	0.000525	U	--
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)			mg/kg	0.000597	U	0.000575	U	NM		0.000525	U	--
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)			mg/kg	0.000597	U	0.000575	U	0.000579	U	0.000525	U	--
4:2 Fluorotelomer sulfonic acid (4:2 FTS)			mg/kg	0.00119	U	0.00115	U	0.00116	U	0.00105	U	--
6:2 Fluorotelomer sulfonic acid (6:2 FTS)			mg/kg	0.000597	U	0.000575	U	0.000579	U	0.000525	U	--
8:2 Fluorotelomer sulfonic acid (8:2 FTS)			mg/kg	0.000597	U	0.000575	U	0.000579	U	0.000525	U	--
SPLP PFAS	**VT MCL**											
Perfluorobutanoic acid (PFBA)			ng/l	**1.08**	J	**0.441**	J	**1.16**	J	NA		
Perfluorobutanesulfonic acid (PFBS)			ng/l	1.99	U	1.97	U	**0.397**	J	NA		
Perfluoropentanoic acid (PFPeA)			ng/l	**1.08**	J	**0.453**	J	**0.588**	J	NA		
Perfluoropentanesulfonic Acid (PFPeS)			ng/l	1.99	U	1.97	U	**0.374**	J	NA		
Perfluorohexanoic acid (PFHxA)			ng/l	**0.991**	J	**0.441**		**1.1**	J	NA		
Perfluorohexanesulfonic acid (PFHxS)	20		ng/l	1.99	U	1.97	U	**1.17**	J	NA		
Perfluoroheptanoic acid (PFHpA)	20		ng/l	**1.11**	J	**0.354**	J	**3.44**		NA		
Perfluoroheptanesulfonic acid (PFHpS)			ng/l	1.99	U	1.97	U	1.94	U	NA		
Perfluorooctanoic acid (PFOA)	20		ng/l	**5.22**		**2.24**		**118**		NA		
Perfluorooctanesulfonic acid (PFOS)	20		ng/l	**2.87**		**2.06**		**1.56**		NA		
Perfluorononanoic acid (PFNA)	20		ng/l	**0.868**	J	1.97	U	1.94	U	NA		
Perfluorononanesulfonic acid (PFNS)			ng/l	1.99	U	1.97	U	1.94	U	NA		
Perfluorodecanoic acid (PFDA)			ng/l	1.99	U	1.97	U	1.94	U	NA		
Perfluorodecanesulfonic acid (PFDS)			ng/l	1.99	U	1.97	U	1.94	U	NA		
Perfluoroundecanoic acid (PFUnA)			ng/l	1.99	U	1.97	U	1.94	U	NA		
Perfluorododecanoic acid (PFDoA)			ng/l	1.99	U	1.97	U	1.94	U	NA		
Perfluorotridecanoic acid (PFTrDA)			ng/l	1.99	U	1.97	U	1.94	U	NA		
Perfluorotetradecanoic Acid (PFTeDA)			ng/l	1.99	U	1.97	U	1.94	U	NA		
Perfluorooctanesulfonamide (PFOSA)			ng/l	1.99	U	1.97	U	1.94	U	NA		
N-ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA)			ng/l	1.99	U	1.97	U	1.94	U	NA		
N-methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA)			ng/l	1.99	U	1.97	U	1.94	U	NA		
4:2 Fluorotelomer sulfonic acid (4:2 FTS)			ng/l	1.99	U	1.97	U	1.94	U	NA		
6:2 Fluorotelomer sulfonic acid (6:2 FTS)			ng/l	1.99	U	1.97	U	1.94	U	NA		
8:2 Fluorotelomer sulfonic acid (8:2 FTS)			ng/l	1.99	U	1.97	U	1.94	U	NA		
PFAS VT 5 (total)	20		ng/l	**10.1**	Y	**6.62**	Y	**126**	Y	NA		
Percent Solids												
Solids, Total			%	**81.1**		**81.1**		**79.4**		**84.7**		

Notes:

ug/kg	Microgram per liter
ng/L	Nanograms per liter (parts per trillion)
--	No comparison because analytes were not detected above laboratory reporting limits
RPD	Relative Percent Difference between the sample result and the blind field duplicate result
U	Not detected above laboratory reporting limit
Y	calculated value
J	Estimated value less than the reporting limit, but greater than the method detection limit
F	Estimated maximum value
NA	Not Analyzed
Bold	Detected above laboratory method reporting limit
Bold	Detected above VT standards
VT MCL	Vermont Water Supply Rule Maximum Contaminant Levels (Water Supply Rule; March 17, 2020)
PFAS VT 5 (total)	sum of PFHxS, PFHpA, PFNA, PFOS, PFOA

APPENDIX A

WARRANTY DEED

KNOW ALL PERSONS BY THESE PRESENTS THAT we, **JAMES J. RONDINONE and LINDA L. RONDINONE (f/n/a Linda J. Rondinone),** of Block Island, County of Washington and State of Rhode Island, Grantors, in consideration of ten dollars and other good and valuable consideration paid to our full satisfaction by **BRIAN T. O'NEIL and SIGNE E. O'NEIL,** husband and wife, of the City of North Adams, County of Berkshire and Commonwealth of Massachusetts, Grantees, by these presents do freely **GIVE, GRANT, SELL, CONVEY and CONFIRM** unto the said Grantees, **BRIAN T. O'NEIL and SIGNE E. O'NEIL,** husband and wife, as tenants by the entirety, and their heirs and assigns, forever, a certain parcel of land situated in the Town of Pownal, County of Bennington and State of Vermont, described as follows, viz:

Being all and the same land and premises conveyed to James J. Rondinone and Linda J. Rondinone (n/k/a Linda L. Rondinone)by Warranty Deed of Cleeland Corporation dated December 17, 2004 and recorded in Volume 137, Page 571 of the Town of Pownal Land Records and being more particularly described as follows:

Beginning at an iron pipe on the southerly side of the Selected Road which runs from Pownal Center to North Pownal, which pipe marks the northwest corner of lands deeded to Martin G. Lingner and wife by Helen K. Church and husband by warranty deed of even date, and proceeding north 74° 00' west along the southerly side of said Selected Road 48 feet; thence north 58° 47' west along the southerly side of said Selected Road 497 feet to an iron pipe; thence south 2" 02' east 199 feet to an iron pipe; thence south 0° 57' east 70 feet to an iron pipe; thence south 75° 13' east 471 feet to an iron pipe; thence north 13° 08' east 200 feet to the place of beginning, containing 2.61 acres be the same more or less. ALL bearings given is the above described parcel are true.

Subject to and together with the benefit of a Portable Water Supply Permit and Wastewater System Permit issued by the State of Vermont, Case Number WW-8-0814, and recorded in Volume 66, Page 198 of the town of Pownal Land Records.

Reference is hereby made to the above mentioned instruments, the records thereof, the references therein made, and their respective records and references, in further aid of this description.

PEET LAW GROUP
55 PATCHEN ROAD
SOUTH BURLINGTON,
VERMONT
05403
TEL. (802) 860-4767

Pownal, VT Town Clerk's Office
Received for Record
Apr 25 2022 at 2:30 o'clock PM
and recorded in Book 181 Page 87
Attest: Town Clerk

Confirmation number
1-490-611-712

Transferee's Name: BRIAN T. O'NEIL
Property Location: 0 NORTH POWNAL ROAD
Date of this Closing: Apr-15-2022

Note: Long names or addresses may not display fully on the paper copy of the return, but the full names and addresses are submitted electronically to the Town and Department.

LOCAL AND STATE PERMITS AND ACT 250 NOTICE

This serves as notice that:

- The property being transferred may be subject to regulations governing potable water supplies and wastewater systems under 10 V.S.A.Chapter 64 and building, zoning and subdivision regulations;
- The property being transferred may be subject to Act 250 regulations regarding land use and development under 10 V.S.A.Chapter 151;
- The parties have an obligation to investigate and disclose knowledge regarding flood regulations affecting the property.

To determine if the property is in compliance with or exempt from these rules, contact the relevant agency.Contact information is provided in the instructions.

Town Clerk - Sign into your myVtax to enter this recording information. After you have entered the recording information print a copy to deliver to the primary Transferee per 32 V.S.A 9607.

This section to be completed by Town or City Clerk

Book Number* 181	Page Number* 87-89	Grand List year* 2022
City or Town* Pownal	Parcel ID Number* 022-25	Date of Record* 4/21/2022
Grand List Value 9100-	Grand List Category* M	SPAN* 495-156-10363
Comments, additional information, etc.		

☐ Duplicate Return Suspected ☐ Portion of the property sold/subdivision ☐ Original Return Waiting on Deed

Deed Acknowledgment and Return Received

SIGNED Julieann M Baker Clerk DATE 4/21/2022

For Town Use Only

4/21/22
E-Filed

VT Form	
PTT-172	VERMONT PROPERTY TRANSFER TAX RETURN

1-490-611-712
Confirmation number

Conf. 4/20/22 @ 14:44:34 JMW
For Town Use Only

TRANSFERORS (Sellers)

RONDINONE JAMES J.
1577 BEACON HILL ROAD PO BOX 1048
BLOCK ISLAND, RI 02807

TRANSFEREES (Buyers)

O'NEIL BRIAN T
976 NOTCH ROAD
NORTH ADAMS, MA 01247

*Any additional transferors or transferees are listed at the bottom of this page

Date Acquired by Transferor: Dec-17-2004 Date of this Closing: Apr-15-2022 Land Size (acres): 2.61

Property Physical Location:	City/Town:	SPAN#	Check if property is located in multiple cities or towns ☐
0 NORTH POWNAL ROAD	Pownal	495-156-10363	This sale did not involve land ☐

Buyer Seller relationship type: If other, description:

If transfer is exempt from Property Transfer Tax: 00 None

Interest in property: Fee Simple If other, description:

If "undivided" percent of interest:

Type of building construction: None If other, description:

Transferors use of property before transfer: Open Land If other, description:

Transferees use of property after transfer: Open Land If other, description:

Will the property be rented after transfer? No Enrolled in the Current Use Program? No

Have development rights been conveyed separately? No New owner elects to continue current use enrollment? No

Does the transferee hold title to any adjoining property: No

Value paid or transferred as defined in 32 V.S.A. § 9601(6)	$35,000.00
Value paid or transferred for personal property	$0.00
Value paid or transferred for real property	$35,000.00
Tax Due	$507.50

Preparer's Name: KATHERINE PERANIO
Preparer's Address: SOUTH BURLINGTO, VT 05403-0000
Preparer's Phone: (802) 860-4767
Preparer's E-mail: katherine@peetlaw.com

Additional Transferor (S) / Transferee (B)

S	LINDA L RONDINONE	1577 BEACON HILL ROAD PO BOX 1048 BLOCK ISLAND RI 02807-0000
B	SIGNE E O'NEIL	976 NOTCH ROAD NORTH ADAMS MA 01247-0000

LAW OFFICES OF
JACOBS, McCLINTOCK & SCANLON
BENNINGTON, VERMONT 05201

WARRANTY DEED

KNOW ALL PERSONS BY THESE PRESENTS that, **CLEELAND CORPORATION,** a Vermont Corporation, with it principal place of business in the Town of Pownal, County of Bennington, and State of Vermont, hereinafter referred to as Grantor, in the consideration of One Dollar and Other Good and Valuable Consideration paid to Grantor's full satisfaction by **JAMES J. RONDINONE and LINDA J. RONDINONE,** husband and wife, of Block Island, County of Washington, and State of Rhode Island, hereinafter referred to as Grantees, by these presents do freely **GIVE, GRANT, SELL, CONVEY and CONFIRM** unto the said Grantees, as husband and wife, as tenants by the entirety, and their heirs and assigns forever, a certain piece of land in the Town of Pownal, County of Bennington, and State of Vermont, described as follows, viz:

Being "Parcel Three" in a Quitclaim Deed from Cleveland E. Dodge, Jr. and Phyllis B. Dodge to Cleeland Corporation dated November 18, 1986 and recorded November 20, 1986 in Book 82 at Page 524 of the Pownal, Vermont Land Records.

Being also all and the same lands and premises conveyed to Cleveland E. Dodge, Jr. And Phyllis B. Dodge by Warranty Deed of Earle V. Church and Helen K. Church dated June 18, 1971 and recorded August 5, 1971 in Book 68 at Page 387 of said Land Records.

See Schedule A attached hereto and made apart hereof for a further and more particular description of said lands and premises.

TO HAVE AND TO HOLD said granted premises, with all the privileges and appurtenances thereof, to the said Grantees,

SCHEDULE A

Being "Parcel Three" in a Quitclaim Deed from Cleveland E. Dodge, Jr. and Phyllis B. Dodge to Cleeland Corporation dated November 18, 1986 and recorded November 20, 1986 in Book 82 at Page 524 of the Pownal, Vermont Land Records.

Being also all and the same lands and premises conveyed to Cleveland E. Dodge, Jr. And Phyllis B. Dodge by Warranty Deed of Earle V. Church and Helen K. Church dated June 18, 1971 and recorded August 5, 1971 in Book 68 at Page 387 of said Land Records. Said lands and premises are more particularly described therein as follows:

> IT BEING A PORTION OF THE LANDS AND PREMISES CONVEYED UNTO THE SAID Helen K. Church by quit claim deed of Stephen H. Gilman recorded January 15, 1971 in Book 68 Page 189 of the Pownal Land Records. Said lands to be conveyed are described as follows: Beginning at an iron pipe on the southerly side of the Selected Road which runs from Pownal Center to North Pownal, which pipe marks the northwest corner of lands deeded to Martin G. Lingner and wife by Helen K. Church and husband by warranty deed of even date, and proceeding north 74° 00' west along the southerly side of said Selected Road 48 feet; thence north 58° 47' west along the southerly side of said Selected Road 497 feet to an iron pipe; thence south 2" 02' east 199 feet to an iron pipe; thence south 0° 57' east 70 feet to an iron pipe; thence south 75° 13' east 471 feet to an iron pipe; thence north 13° 08' east 200 feet to the place of beginning, containing 2.61 acres be the same more or less. ALL bearings given is the above described parcel are true.

FORM 902 VERMONT — QUIT CLAIM DEED REV. 9/80

Know all Men by these Presents

That both we, CLEVELAND E. DODGE, JR., and wife, PHYLLIS B. DODGE,

of Pownal in the County of Bennington and State of Vermont Grantors, in the consideration of One dollar and other good and valuable consideration Dollars paid to our full satisfaction by

CLEELAND CORPORATION, a Vermont corporation with its principal place of business at

~~of~~ Pownal in the County of Bennington and State of Vermont Grantee, have **REMISED, RELEASED, AND FOREVER QUITCLAIMED** unto the said

CLEELAND CORPORATION, its successors and assigns

~~heirs or assigns,~~

all right and title which we, the said

CLEVELAND E. DODGE, JR., and wife, PHYLLIS B. DODGE

or our heirs have in, and to a certain piece of land in Pownal in the County of Bennington and State of Vermont, described as follows, viz:

PARCEL ONE: Being the same lands and premises conveyed to these Grantors by warranty deed of Jack Eaton and wife dated August 18, 1951, recorded August 21, 1951 in Book 58 at page 237 of Pownal, Vermont Land Records.

PARCEL TWO: Being the same lands and premises conveyed to these Grantors by warranty deed of Earl V. Church and wife dated June 27, 1962, recorded July 16, 1962 in Book 63 at page 45 of said land records.

PARCEL THREE: Being the same lands and premises conveyed to these Grantors by warranty deed of Earle (sic) V. Church and wife, Helen K. Church, dated June 18, 1971, recorded August 5, 1971 in Book [illegible] at page 387 of said land records.

Reference is hereby made to the above mentioned deeds for a further and more particular description of the lands and premises herein conveyed.

TO HAVE AND TO HOLD all our *right and title in and to said quit-claimed premises, with the appurtenances thereof, to the said*

CLEELAND CORPORATION, its successors and assigns

~~heirs and assigns~~ *forever.*

AND FURTHERMORE we *the said*

CLEVELAND E. DODGE, JR. and wife, PHYLLIS B. DODGE

do for ourselves, our *heirs, executors and administrators, covenant with the said*

CLEELAND CORPORATION, its successors and assigns

~~heirs and assigns~~, *that from and after the ensealing of these presents* we *the said*

CLEVELAND E. DODGE, JR. and wife, PHYLLIS B. DODGE

will have and claim no right, in, or to the said quit-claimed premises.

IN WITNESS WHEREOF, we *hereunto set* our *handsand seal* s *this* 18 *day of* November *A.D. 19* 86

In Presence of

Esabelle Aseem — (L.S.)

Gail W. Bigart — as to PBD — Phyllis B. Dodge (L.S.)

(L.S.)

Gail W. Bigart, Margaret Kelly — as to CED, Jr. — Cleveland E. Dodge (L.S.)

(L.S.)

(L.S.)

STATE OF VERMONT, Bennington **County** } ss. At Bennington this 18 day of November A. D. 19 86

CLEVELAND E. DODGE, JR., and PHYLLIS B. DODGE

personally appeared, and they *acknowledged this instrument, by* them *sealed and subscribed, to be* their *free act and deed.*

Before me Gail W. Bigart

Notary Public (Title)

Vermont Property Transfer Tax
32 V.S.A. Chap. 231
-ACKNOWLEDGMENT-
Return Rec'd.--Tax Paid--Board of Health Cert. Rec'd.
Vt. Land Use & Development Plans Act Cert. Rec'd
Return No. A789851
Signed Rachel Mason, Clerk
Date Nov 20 1986

Received for record this 20th day of November 1986 at 1:30 P.M.

Rachel Mason
Town Clerk

APPENDIX B

APPENDIX B
SAMPLING SUMMARY
QUARRY HILL ROAD

Street	Street Number	Station State	Station City	Station Zip	Sample Date	Purging Start Time	Sample Time	Sample Location	Sample ID	QC Sample Code	Resident's First Name	Resident's Last Name	Owner Phone Number	Contact email	Water Supply Type	Well Location
Quarry Hill Road	583	Vermont	Pownal	05261	9/13/2023	10:37	10:47	Pressure Tank Spigot	583 Quarry Hill Road 230913	O	Signe	O`Neil	413-884-5351	signekutzer@gmail.com	Bedrock	100 feet east of garage
Quarry Hill Road	583	Vermont	Pownal	05261	9/13/2023	10:37	10:47	Pressure Tank Spigot	583 Quarry Hill Road 230913	FD	Signe	O`Neil	413-884-5351	signekutzer@gmail.com	Bedrock	100 feet east of garage
Quarry Hill Road	583	Vermont	Pownal	05261	9/13/2023	10:37	10:47	Pressure Tank Spigot	583 Quarry Hill Road 230913	FB	Signe	O`Neil	413-884-5351	signekutzer@gmail.com	Bedrock	100 feet east of garage
Quarry Hill Road	581	Vermont	Pownal	05261	9/13/2023	11:07	11:17	Pressure Tank Spigot	581 Quarry Hill Road 230913	O	Peter	Kutzer	802-823-5757	gammelgardencreamery@gmail.com	Bedrock	300 feet southeast of house
North Pownal Road	1522	Vermont	Pownal	05261	9/13/2023	11:58	12:08		1522 North Pownal Road 230913	O	Nelson	Brownell	802-823-5656	Nelsonbrownell@rocketmail.com	Bedrock	About 50 feet northeast of house at edge of driveway
Quarry Hill Road	990	Vermont	Pownal	05261	9/13/2023	12:29	12:41	Outside Spigot	990 North Pownal Road 230913	O	Angie	Ligner	802-823-7284		Bedrock	5 feet left of house
North Pownal Road	431	Vermont	Pownal	05261	9/13/2023	12:53	13:03	Pressure Tank Spigot	431 Quarry Hill Road 230913	O	Sabin	Willett	508-661-9579	Sabinwillett@gmail.com	Bedrock	5feet west of house
North Pownal Road	871	Vermont	Pownal	05261	9/13/2023	13:17	13:29	Pressure Tank Spigot	871 North Pownal Road 230913	O	Georgene	Villenueve	802-823-5521	Georgene05260@gmail.com	Bedrock	200 south of house at end of driveway
North Pownal Road	717	Vermont	Pownal	05261	9/14/2023	07:57	8:00	Pressure Tank Spigot	717 North Pownal Road	O	Arianna	Cutter	802-379-0757	Airl717@aim.com	Shallow	300 ft to the front of the house, in tall shurbery
Mount Anthony Road	737	Vermont	Pownal	05261	9/14/2023	08:30	08:45	Pressure Tank Spigot	737 Mount Anthony Road 230914	O	Darlene	Church	802-823-7813	Dschurch55@hotmail.com	Bedrock	400 feet northwest of property, up the hill
Quarry Hill Road	320	Vermont	Pownal	05261	9/14/2023	09:21	09:31	Pressure Tank Spigot	320 Quarry Hill Road 230914	O	Sally	Dodge	802-223-2498		Bedrock	3 ft from side of garage
North Pownal Road	1187	Vermont	Pownal	05261	10/4/2023	11:12	11:25	Outside Spigot	1187 North Pownal Road	O	Erich	Augestein	401-573-7810	Thevike@comcast.com	Bedrock	20 feet south of house
Quarry Hill Road	581	Vermont	Pownal	05261	10/4/2023	15:17	15:27	Pressure Tank Spigot	581 Quarry Hill Road 231004	O	Peter	Kutzer	802-823-5757	gammelgardencreamery@gmail.com	Bedrock	300 ft east of house
Quarry Hill Road	581	Vermont	Pownal	05261	10/4/2023	15:17	15:27	Pressure Tank Spigot	DUP_2	FD	Peter	Kutzer	802-823-5757	gammelgardencreamery@gmail.com	Bedrock	300 ft east of house
North Pownal Road	871	Vermont	Pownal	05261	10/30/2023	9:16	9:26	Pressure Tank Spigot	871 North Pownal 20231030	O	Georgene	Villenueve	802-823-5521	Georgene05260@gmail.com	Bedrock	200 ft south
North Pownal Road	871	Vermont	Pownal	05261	10/30/2023	9:16	9:26	Pressure Tank Spigot	DUP 231030_1	FD	Georgene	Villenueve	802-823-5521	Georgene05260@gmail.com	Bedrock	200 ft south
Quarry Hill Road	581	Vermont	Pownal	05261	10/30/2023	9:49	9:59	Pressure Tank Spigot	581 Quarry Hill Road 231030	O	Peter	Kutzer	802-823-5757	gammelgardencreamery@gmail.com	Bedrock	300 ft east of house

APPENDIX B
SAMPLING SUMMARY
QUARRY HILL ROAD

Street	Street Number	Well Year Installation	Well Depth	Well Tag Number	Latitude	Longitude	Water Softener	Water Softener Type	Water Softener Discharge Location	Water Filter	Water Filter Type	Odor	Color	Color of?	Sample Area Inventory /Use	Temperature (F)	General Comments
Quarry Hill Road	583	2022	600	63504	42.8014	-73.2522487	no			no		no	no		Basement utility, propane boiler, hot water tank, and dehumidifier	70	Purged through hose to exterior
Quarry Hill Road	583	2022	600	63504	42.8014	-73.2522487	no			no		no	no		Basement utility, propane boiler, hot water tank, and dehumidifier	70	Purged through hose to exterior
Quarry Hill Road	583	2022	600	63504	42.8014	-73.2522487	no			no		no	no		Basement utility, propane boiler, hot water tank, and dehumidifier	70	Purged through hose to exterior
Quarry Hill Road	581	2003	310	24717	42.80073	-73.2515025	no			no		no	no		Basement, utility/ storage	70	Ran tap in creamery that is connected to residential well
North Pownal Road	1522	1987	200		42.80142	-73.243783	yes	Isobar watersoft	Septic	no		no	no		Utility, oil furnace	70	Iron in water
Quarry Hill Road	990	1962	200		42.80138	-73.250766	yes		Septic	yes	Sediment	no	no				Sample is coming through a sediment filter, not going through water softener
North Pownal Road	431	2001	133		42.79901	-73.2500643	yes	Best water conditioning service	Septic	no		no	no		Basement utility / storage	70	Well depth 133' pump at 106' static level at 22'
North Pownal Road	871	1973	160		42.80273	-73.252796	yes	Blakewater solutions	Septic	yes	Sediment	no	no				
North Pownal Road	717				42.80385	-73.2545675	no			no		no	no				Well installed before 1974
Mount Anthony Road	737	2018	400	57192	42.80455	-73.2554955	yes	WaterSoft	Septic	yes	Sediment	no	yes	Yellow			Before the filtration system the water was yellow
Quarry Hill Road	320				42.7974	-73.2495001	yes	Culligan	Septic	yes		No	No				Owner was not here, details of well unknown.
North Pownal Road	1187	2019	300	53342	42.80395	-73.2483158	no			yes	Paper filte	no	no			74	Could not get into owners home, started purge by turning on outside spigot north of home. Iron in water and staining on house.
Quarry Hill Road	581	2003	350	24717	42.80089	-73.2519931	no			no		no	no			70	Owner believes there are high concentrations of calcium.
Quarry Hill Road	581	2003	350	24717	42.8014	-73.2521092	no			no		no	no			70	
North Pownal Road	871	1973	160		42.80283	-73.2526598	yes			yes	Sediment	no	no			50	
North Pownal Road	871	1973	160		42.80283	-73.2526603	yes	Blakewater solutions		yes	Sediment	no	no				
Quarry Hill Road	581	2003	350	24717	42.80143	-73.2521711	no			yes	Sediment	no	no			50	

Weston & Sampson℠

PROJECT	REPORT OF BORING No.	TP-1
583 Quarry Hill Road	SHEET 1 OF 1	
	Project No.	ENG23-2827
	CHKD BY	

BORING Co.	N/A	BORING LOCATION	25 feet north of the 583 Quarry Hill residence
BORING Co Rep.	N/A	GROUND SURFACE ELEV.	DATUM
WSE Rep.:	Sophia Haley	DATE START 10/4/23	DATE END 10/4/23

Drill Rig:	N/A (Excavation)
Sampler:	Sophia Haley
CASING:	N/A
CASING SIZE:	N/A Method N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0						NA	(0-1ft) Dark brown medium to coarse SILT, some coarse gravel, some brick, wet		FILL
							(1-1.5ft) Tan fine to medium SILT, wet		
							(1.5-3.5ft) Dark brown medium SILT, some coarse gravel, some brick, wet		
5									
10									
15									
20									
25									
30									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
Sample TP-1 taken 2.5 ft in depth

NOTES:

BORING No. TP-1

Weston & Sampson℠

PROJECT	REPORT OF BORING No.	TP-2
583 Quarry Hill Road	SHEET 1 OF 1	
	Project No.	ENG23-2827
	CHKD BY	

BORING Co.	N/A	BORING LOCATION	20 feet west of the 583 Quarry Hill residence
BORING Co Rep.	N/A	GROUND SURFACE ELEV.	DATUM
WSE Rep.:	Sophia Haley	DATE START 10/4/23	DATE END 10/4/23

Drill Rig:	N/A (Excavation)
Sampler:	Sophia Haley
CASING:	N/A
CASING SIZE:	N/A Method N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0						NA	(0-2ft) Brown/Gray medium to coarse SILT, some coarse gravel and rocks, wet		FILL
						NA	(2-3ft) Brown fine to medium SILT		NATIVE
5									
10									
15									
20									
25									
30									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
Sample TP-2 taken 1.5 ft in depth

NOTES:

BORING No. TP-2

Weston & Sampson℠

PROJECT	REPORT OF BORING No.	TP-3
583 Quarry Hill Road	SHEET 1 OF 1	
	Project No.	ENG23-2827
	CHKD BY	

BORING Co.	N/A	BORING LOCATION	8 feet south of the 583 Quarry Hill well
BORING Co Rep.	N/A	GROUND SURFACE ELEV.	DATUM
WSE Rep.:	Sophia Haley	DATE START 10/4/23	DATE END 10/4/23

Drill Rig:	N/A (Excavation)
Sampler:	Sophia Haley
CASING:	N/A
CASING SIZE:	N/A Method N/A

GROUNDWATER READINGS

DATE	TIME	WATER AT	CASING AT	STABILIZATION TIME

DEPTH (feet)	CASING (lb/ft)	SAMPLE No.	SAMPLE PEN/REC (in)	SAMPLE DEPTH (ft)	SAMPLE BLOWS/6"	PID (ppm)	SAMPLE DESCRIPTION	NOTES	STRATUM DESCRIPTION
0						NA	(0-4ft) Brown fine to medium SILT		NATIVE
5									
10									
15									
20									
25									
30									

GRANULAR SOILS		COHESIVE SOILS	
BLOWS/FT	DENSITY	BLOWS/FT	DENSITY
0-4	V. LOOSE	0-2	V. SOFT
4-10	LOOSE	2-4	SOFT
10-30	M. DENSE	4-8	M. STIFF
30-50	DENSE	8-15	STIFF
> 50	V. DENSE	15-30	V. STIFF
		> 30	HARD

REMARKS:
Sample TP-3 taken 2 ft in depth, DUP taken here

NOTES:

BORING No. TP-3

APPENDIX A
PHOTOGRAPH LOG
583 QUARRY HILL ROAD
POWNAL, VERMONT

Photo #1 : View of northern side of the 583 Quarry Hill Road residence, facing west. TP-1 is located north of the building.

Photo #2 : View of TP-1 test pit location, facing northwest.

Photo #3 : TP-1, Bisson fill soil.

Photo #4: View of TP-2, facing west.

Photo #5 : TP-2, Williamstown fill soil.

Photo #6 : View of TP-3, located south of the well, facing north.

APPENDIX A
PHOTOGRAPH LOG
583 QUARRY HILL ROAD
POWNAL, VERMONT

Photo #7 : View of 581 Quarry Hill Road Point of Entry Treatment (POET) system.

Photo #8 : View of 583 Quarry Hill Road POET system.

Photo #9 : 871 North Pownal Road POET system.

APPENDIX C

WASTEWATER SYSTEM AND POTABLE WATER SUPPLY PERMIT

LAWS/REGULATIONS INVOLVED

10 V.S.A. Chapter 64, Potable Water Supply and Wastewater System Permit
Wastewater System and Potable Water Supply Rules, Effective April 12, 2019

Permittee(s): Brian & Signe O'Neil
976 Notch Road
North Adams, MA 01247

Permit Number: WW-8-0814-1

This permit affects the following property/properties in Pownal, Vermont:

Lot	Parcel	SPAN	Acres	Book(s)/Page(s)#
1	2-25	495-156-10363	2.61	Book:137 Page(s):571

This application, consisting of an amended permit with changes including use of a mounded on-site wastewater, eliminate the previous replacement area, and onsite well repositioning, located at 2-25 North Pownal Road in Pownal, Vermont, is hereby approved under the requirements of the regulations named above subject to the following conditions. Any person aggrieved by this permit may appeal to the Environmental Court within 30 days of the date of issuance of this permit in accordance with 10 V.S.A. Chapter 220 and the Vermont Rules of Environmental Court Proceedings.

1. GENERAL

1.1 The permittee is responsible to record this permit in the Pownal Land Records within 30 days of issuance of this permit and prior to the conveyance of any lot subject to the jurisdiction of this permit.

1.2 The permittee is responsible to record the design and installation certifications and other documents that are required to be filed under these Rules or under a permit condition in the Pownal Land Records.

1.3 Each assign or successor in interest shall be shown a copy of the Wastewater System and Potable Water Supply Permit and the stamped plan(s) prior to the conveyance of a lot.

1.4 The wastewater system includes the use of an Innovative/Alternative component. Each prospective owner of a lot that utilizes an Innovative/Alternative component shall be shown a copy of the **Innovative/Alternative System Approval letter #2004-02-R9 for Advanced Enviro-Septic® (AES) and Enviro-Septic® (ES) Pipe Leaching System** for model **Environ-Septic ®** prior to conveyance of the lot.

1.5 By acceptance of this permit, the permittee agrees to allow representatives of the State of Vermont access to the property covered by the permit, at reasonable times, for the purpose of ascertaining compliance with the Vermont environmental and health statutes and regulations, and permit conditions.

1.6 This permit does not relieve the landowner from obtaining all other approvals and permits from other State Agencies or Departments, or local officials prior to construction.

1.7 All conditions set forth in WW-8-0814-1 shall remain in effect except as amended or modified herein.

2. CONSTRUCTION

2.1 Construction shall be completed as shown on the plans and/or documents prepared by John E. Dupras P.E., with the stamped plans listed as follows:

Title	Sheet #	Plan Date	Revision
Prepared for Brian O'Neil, North Pownal Road, Town of Pownal, Vermont	C-1	07/07/2022	
Prepared for Brian O'Neil, North Pownal Road, Town of Pownal, Vermont	C-2	07/07/2022	

2.2 Construction of wastewater systems or potable water supplies, or buildings or structures (as defined by the Wastewater System and Potable Water Supply Rules), or campgrounds, not depicted on the stamped plans, or identified in this permit, is not allowed without prior approval by the Drinking Water and Groundwater Protection Division.

2.3 No buildings, roads, earthwork, re-grading, excavation, or other construction that might interfere with the operation of the wastewater system or potable water supply are allowed on or near the site-specific wastewater system, wastewater replacement area, or potable water supply depicted on the stamped plans. Adherence to all isolation distances that are set forth in the Wastewater System and Potable Water Supply Rules is required.

3. INSPECTIONS

3.1 No permit issued by the Secretary shall be valid for a substantially completed potable water supply and wastewater system until the Secretary receives a signed and dated certification from a qualified Vermont Licensed Designer (or where allowed, the installer) on a Secretary-approved form that states:

"I hereby certify that, in the exercise of my reasonable professional judgment, the installation-related information submitted is true and correct and the potable water supply and wastewater system were installed in accordance with the permitted design and all permit conditions, were inspected, were properly tested, and have successfully met those performance tests"

or which satisfies the requirements of §1-311 of the referenced rules.

3.2 Prior to the use of the potable water supply, the permittee shall test the water for Arsenic, Escherichia coli (E. coli), Fluoride, Lead, Manganese, Nitrate as N, Nitrite as N, Total Coliform Bacteria, Uranium, Adjusted Gross Alpha Particle Activity, Chloride, Sodium, Iron, Odor and pH. All water quality tests shall be conducted at a laboratory certified by the Vermont Department of Health (a list of which can be found on the VDH website). Results of the water tests shall be submitted to the Vermont Department of Health prior to use or within 60 days of the submission of the Installation Certification required in Condition 3.1, whichever comes first.

3 DESIGN FLOW

4.1 Lot use and design flows (gpd) shall correspond to the following:

Lot	Building	Building Use / Design Flow Basis	Wastewater	Water
1	Proposed	4-bedroom single family residence 7-person maximum occupancy	490	490

5. WASTEWATER SYSTEM

5.1 Lot 1 is authorized to install a gravity mounded Presby Environ-Septic® wastewater disposal system. Prior to the construction or site work, a designer shall flag the proposed leachfield, and the owner shall maintain the flags until commencement of construction of the system.

5.2 Should the wastewater system fail and not qualify as a minor repair or for an exemption, the landowner shall engage a qualified Licensed Designer to evaluate the cause of the failure and submit an application to the Drinking Water and Groundwater Protection Division, and obtain approval thereof, prior to correcting the failure.

5.3 Should the wastewater system experience future performance issues, including but not limited to failure, the landowner shall engage a qualified Licensed Designer who will contact one the technology's

listed Service Providers regarding the performance issue and permit the Service Provider to inspect the site to ensure reporting requirements of the Innovative/Alternative Approval may be met.

5.4 This permit does not relieve the permittee of the obligations of Title 10, Chapter 48, Subchapter 4, for the protection of groundwater.

6. POTABLE WATER SUPPLY

6.1 Lot 1 is authorized to install an onsite potable water supply. Prior to construction or site work on the lot, a designer shall flag the center of the proposed potable water source and the owner shall maintain the flag until commencement of construction of the source.

6.2 Should the potable water supply fail and not qualify as a minor repair or for an exemption, the landowner shall engage a qualified licensed Designer to evaluate the cause of the failure and submit an application to the Drinking Water and Groundwater Protection Division, and obtain approval thereof, prior to correcting the failure.

Julia S. Moore, Secretary
Agency of Natural Resources

By _____

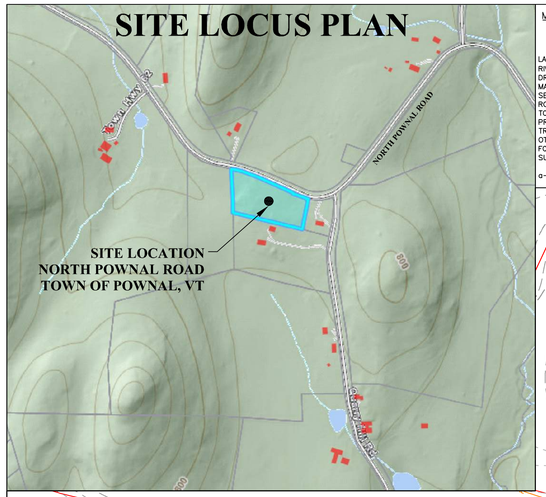
Dated August 5, 2022

Chris Tomberg, Environmental Analyst VI
Rutland Regional Office
Drinking Water and Groundwater Protection Division

Enclosure: I/A Approval Letter

cc: John E. Dupras P.E.
Pownal Planning Commission

SITE LOCUS PLAN



MIMIMUM SETBACK DISTANCES TO SEPTIC SYSTEM

	DISPOSAL FIELD	SEPTIC TANK	SEWER LINE
LAKE AND POND (STANDING WATER)	50'	25'	25'
RIVERS AND STREAMS	50'	25'	10'
DRAINAGE SWALES, DITCHES	25'	---	---
MAIN OR MUNICIPLE WATER LINES	50'	o	o
SERVICE WATER LINES	25'	25'	o
ROADWAYS, DRIVES, PARKING LOTS	10'	5'	o
TOP OF SLOPE, OR SLOPE > 30%	25'	10'	---
PROPERTY LINES	25'	10'	10'
TREES	10'	10'	10'
OTHER DISPOSAL FIELD	10'	---	---
FOUNDATION, OR CURTAIN DRAINS	35'	10'	---
SUCTION WATER LINE	100'	50'	50'

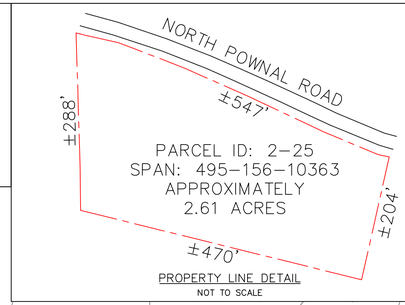
o– REFER TO ENVIRONMENTAL PROTECTION RULES, CHAPTER 1.

MINIMUM SETBACKS TO NEW WATER SUPPLY

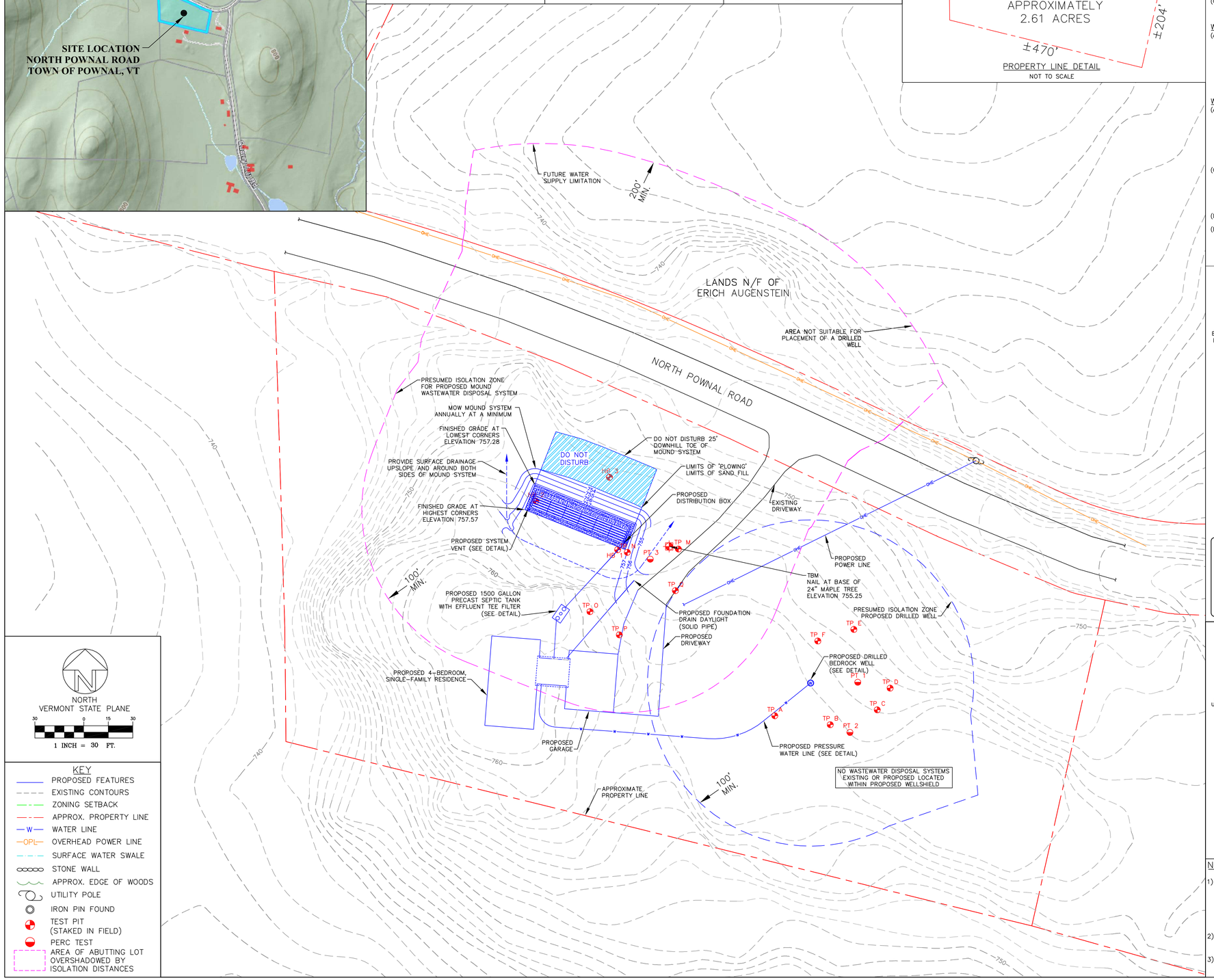
	DRILLED WELL	SHALLOW WELL
ROAD	25'	25'
DRIVEWAY	15'	15'
DOWNGRADIENT SEPTIC	100'	150'
UPGRADIENT SEPTIC	200'	500'
SEPTIC TANK	50'	75'
PROPERTY LINE	10'	10'
BUILDING	10'	10'

PROPOSED RESIDENCE, WELL, AND MOUND SYSTEM ARE LOCATED ON PARCEL ID: 2–25, AND LISTED IN BOOK 137, PAGE 571 IN TOWN OF POWNAL LAND RECORDS.

EXISTING LOT SIZE IS ±2.61 ACRES. DESIGN FOLLOWS THE PRESCRIPTIVE APPROACH. LOT REQUIRES AMENDMENT OF VT DEC WASTEWATER PERMIT WW–8–0814.



PROPERTY LINE DETAIL
NOT TO SCALE



NORTH
VERMONT STATE PLANE

30 0 15 30

1 INCH = 30 FT.

KEY

- PROPOSED FEATURES
- EXISTING CONTOURS
- ZONING SETBACK
- APPROX. PROPERTY LINE
- WATER LINE
- OVERHEAD POWER LINE
- SURFACE WATER SWALE
- STONE WALL
- APPROX. EDGE OF WOODS
- UTILITY POLE
- IRON PIN FOUND
- TEST PIT (STAKED IN FIELD)
- PERC TEST
- AREA OF ABUTTING LOT OVERSHADOWED BY ISOLATION DISTANCES

POTABLE WATER SUPPLY LEAKAGE AND PRESSURE TESTING:

(A) WATER SERVICE LINES AND WATER SERVICE PIPES SHALL BE PRESSURE TESTED AND LEAKAGE TESTED ACCORDING TO ONE OF THE FOLLOWING PROCEDURES PRIOR TO PLACING THE POTABLE WATER SUPPLY INTO SERVICE:
  (1) VERMONT PLUMBING RULES;
  (2) THE AWWA; OR
  (3) BY PRESSURIZING THE LINES AND PIPES WITH WATER AT THE WORKING PRESSURE OF THE SYSTEM OR GREATER AND HOLD WITHOUT A DROP IN PRESSURE FOR A MINIMUM OF 16 MINUTES.

(B) ATMOSPHERIC STORAGE STRUCTURES SHALL BE LEAKAGE TESTED ACCORDING TO THE FOLLOWING PROCEDURE TO ENSURE WATER LOSS IS EQUAL TO OR LESS THAN 0.05 OF 1 PERCENT OF THE TANK CAPACITY PRIOR TO PLACING THE STRUCTURE INTO SERVICE:
  (1) FILLING THE TANK WITH POTABLE WATER AND LET STAND FOR 24 HOURS; AND
  (2) MEASURING THE LOSS OF WATER OVER 24 HOURS.

(C) IF THE WATER SERVICE LINE, WATER SERVICE PIPE, OR ATMOSPHERIC STORAGE STRUCTURE FAILS THE PRESSURE OR LEAKAGE TEST, THE CAUSE OF THE FAILURE SHALL BE REPAIRED, AND THE LINE, PIPE, OR STRUCTURE RETESTED.

WELL WATER QUALITY TESTING REQUIREMENTS:

(A) THE POTABLE WATER SOURCE SHALL BE SAMPLED FOR THE FOLLOWING SUBSTANCES, AND ANY WATER TREATMENT SYSTEM REQUIRED PURSUANT TO SUBSECTION (D) INSTALLED, PRIOR TO ANY WATER USE AUTHORIZED IN THE PERMIT:
  (1) EACH PRIMARY AND SECONDARY CONTAMINANT LISTED IN TABLES 11–5 AND 11–6 OF THE ENVIRONMENTAL PROTECTION RULES, CHAPTER 1, WASTEWATER SYSTEM AND POTABLE WATER SUPPLY RULES, EFFECTIVE APRIL 12, 2019; AND
  (2) ANY SUBSTANCE WITH A GROUNDWATER ENFORCEMENT STANDARD IN THE GROUNDWATER PROTECTION RULE AND STRATEGY THAT THE SECRETARY DETERMINES MAY BE PRESENT IN THE SOURCE.

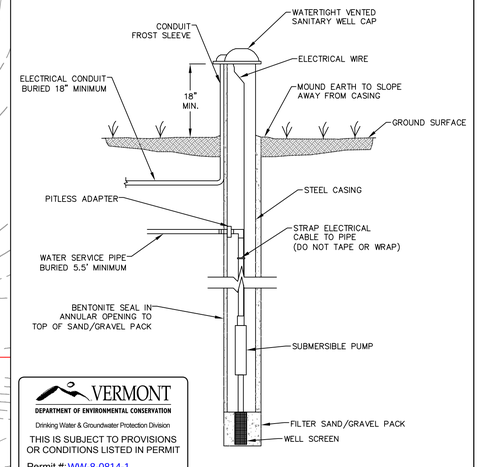
WATER LINE DISINFECTION PROCEDURE:

(A) A POTABLE WATER SUPPLY SHALL BE DISINFECTED PURSUANT TO THE REQUIREMENTS OF SUBSECTION 1–1210, ENVIRONMENTAL PROTECTION RULES, A SUMMARY OF WHICH IS PROVIDED BELOW, PRIOR TO PLACING THE POTABLE WATER SUPPLY IN SERVICE.
  (1) FLUSH THE POTABLE WATER SUPPLY UNTIL THE WATER RUNS CLEAR;
  (2) PROVIDE AN INITIAL DOSAGE OF AT LEAST 100 MG/L OF CHLORINE IN THE POTABLE WATER SOURCE;
  (3) CIRCULATE THE WATER IN THE POTABLE WATER SOURCE; AND
  (4) ALLOW THE WATER TO REST IN THE POTABLE WATER SOURCE FOR A MINIMUM OF 12 TO 24 HOURS BEFORE DISPOSING OF THE CHLORINATED WATER.

(C) DISINFECTION OF WATER SERVICE LINES AND WATER SERVICE PIPES SHALL BE COMPLETED PURSUANT TO THE REQUIREMENTS OF THE VERMONT PLUMBING RULES OR THE FOLLOWING METHOD:
  (1) FILL THE WATER SERVICE LINE OR WATER SERVICE PIPE WITH A WATER/CHLORINE SOLUTION OF 100 MG/L; AND (2) ALLOW THE CHLORINATED WATER TO REST IN THE WATER SERVICE LINE OR WATER SERVICE PIPE FOR A MINIMUM OF 24 HOURS BEFORE DISPOSING OF THE CHLORINATED WATER.

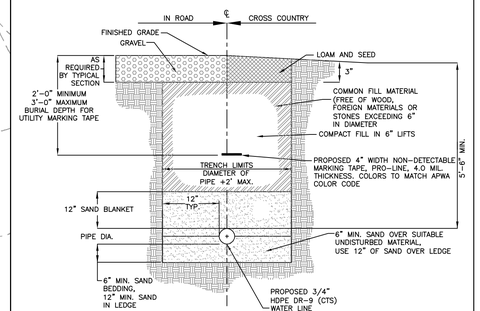
(D) DISINFECTION OF WATER STORAGE TANKS SHALL BE COMPLETED PURSUANT TO AWWA STANDARD C652.

(E) CHLORINATED WATER USED TO DISINFECT OR RESULTING FROM DISINFECTION OF POTABLE WATER SUPPLIES SHALL NOT BE DISCHARGED TO A WASTEWATER SYSTEM OR TO SURFACE WATER. PROPER DISPOSAL OF THE CHLORINATED WATER IS TO THE GROUND SURFACE THROUGH SHEET FLOW THAT INFILTRATES INTO THE SOIL OR DISPOSAL TO A WASTEWATER TREATMENT FACILITY, IF AUTHORIZED BY THE WASTEWATER TREATMENT FACILITY.



VERMONT
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Drinking Water & Groundwater Protection Division
THIS IS SUBJECT TO PROVISIONS OR CONDITIONS LISTED IN PERMIT
Permit #: WW-8-0814-1
Date: 08/05/2022

POTABLE DRILLED WELL DETAIL
NOT TO SCALE



WATER LINE TRENCH DETAIL
NOT TO SCALE

NOTES:

1) THE PROPERTY LINE, EASEMENT, AND OTHER REAL PROPERTY DESCRIPTIONS PROVIDED IN THIS PERMIT APPLICATION ARE FOR THE USE OF THE ANR ONLY. THEY DO NOT DEFINE LEGAL RIGHTS OR MEET LEGAL REQUIREMENTS FOR A LAND SURVEY AS DESCRIBED IN 26 V.S.A. § 2502(4), AND SHALL NOT BE USED IN LIEU OF A SURVEY AS THE BASIS OF ANY LAND TRANSFER OR ESTABLISHMENT OF ANY PROPERTY RIGHT.

2) PROPERTY LINES WERE DERIVED FROM INFORMATION PROVIDED BY OWNER, AND VT GIS PARCEL DATA.

3) PLEASE SEE ATTACHMENTS FOR COMPLETE PERC TEST AND SOILS INFORMATION.

TRINITY ENGINEERING
TECHNICAL SERVICES, LLC
26 UNION STREET, SUITE 1D
NORTH ADAMS, MA 01247
(413) 398–3211 & (802) 694–1919

REV. NO.	DATE	DESCRIPTION	BY
1	7/7/22	ORIGINAL SUBMISSION FOR PERMIT	J.E.D.

STATE OF VERMONT CIVIL JOHN E. DUPRAS No. 7378 LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: J.E.D.
DRAWN BY: G.J.V.
CHECKED BY: J.E.D.
SCALE: AS SHOWN

TITLE: THE STATE OF VERMONT WASTEWATER DISPOSAL SYSTEM AND POTABLE WATER SUPPLY DESIGN

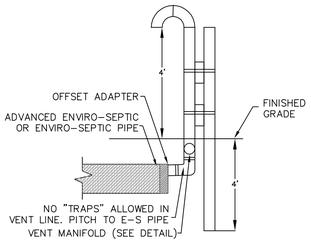
PROJECT: PREPARED FOR BRIAN O'NEIL NORTH POWNAL ROAD TOWN OF POWNAL, VERMONT

DATE: 7/7/2022

PROJECT NUMBER: 22086

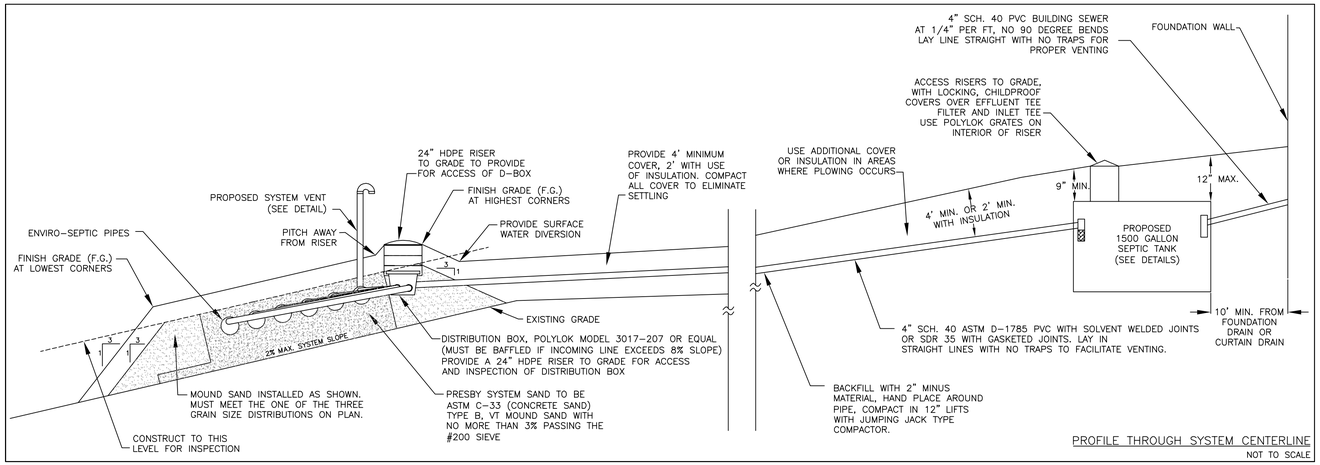
SHEET NUMBER: C-1

SHEET: 1 OF 2

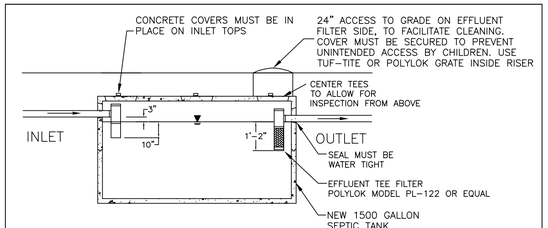


NOTES:
1) USE 2 – 4" STREET ELBOWS AT TOP.
2) PROVIDE 1/4" MESH GAURD AT END OF VENT.
3) USE A 45 ELBOW AT EACH END PLATE, TO CONNECT TO VENT HEADER.
4) USE 4x4x8' P.T. POST WITH STAINLESS STEEL STRAPS TO ATTACH POST TO VENT.
5) IF POSSIBLE USE SDR 35 SOLID WITH STREET ELBOWS, OR 4" SCH 40 PVC.
6) ALL PIPING MUST BE THE SAME COLOR.
7) COORDINATE VENT LOCATION WITH OWNER. VENT LOCATION MAY VARY, SO LONG AS THE VENT HAS CONSTANT PITCH (IE: NO TRAPS) TO PRESBY SYSTEM.

SYSTEM VENT DETAIL
NOT TO SCALE

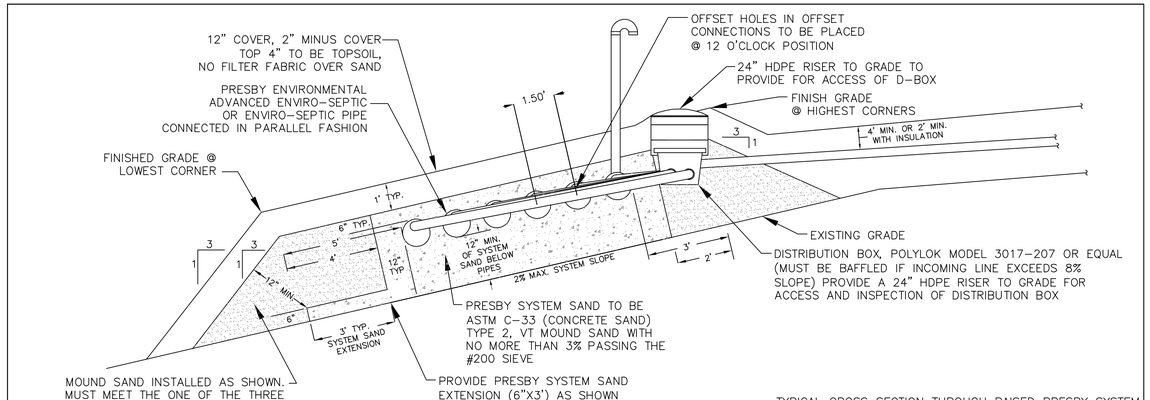


PROFILE THROUGH SYSTEM CENTERLINE
NOT TO SCALE



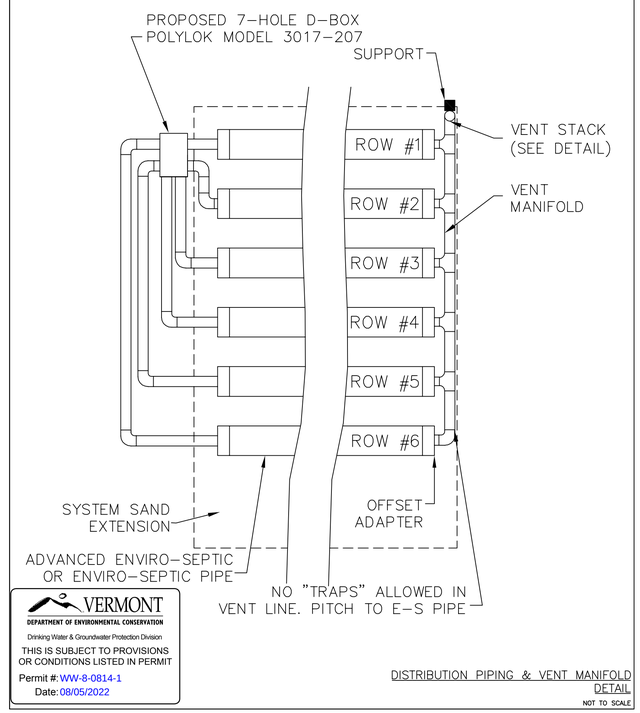
1500 GALLON SEPTIC TANK DETAIL
NOT TO SCALE

NOTES:
1) SEPTIC TANK TO BE PRECAST CONCRETE BY WASHBURN VAULT, OR EQUAL. NO WEEP HOLES ALLOWED IN TANK.
2) TANK TO BE SET LEVEL WITH INLET AND OUTLET PENETRATION AS SHOWN.
3) INLET TO USE 4 x 4 x 4 PVC TEE EXTENDING 10" BELOW OUTLET AS SHOWN.
4) OUTLET TO USE 4 x 4 x 4 PVC TEE EXTENDING 14" BELOW OUTLET AS SHOWN.
5) PROVIDE CENTER ACCESS WITHIN 6" OF SURFACE, WITH STEEL PLATE FOR MAGNETIC LOCATOR.
6) ALL PENETRATIONS TO BE SEALED TO ENSURE TANK IS WATERTIGHT.
7) BACKFILL IN 12" LIFTS, WITH COMPACTION USING 4" MINUS MATERIAL.
8) PLACE 6" OF STONE UNDER SEPTIC TANK TO PROVIDE A SOLID BASE.
9) RISERS TO BE HDPE/PLASTIC.



TYPICAL CROSS SECTION THROUGH RAISED PRESBY SYSTEM
NOT TO SCALE

DESIGN LIMITATIONS AND OPERATIONAL NOTES:
1) SYSTEM IS NOT DESIGNED TO SUPPORT A GARBAGE DISPOSAL AND NONE SHALL BE INSTALLED.
2) SYSTEM IS NOT DESIGNED TO HANDLE BACKWASH FROM A WATER TREATMENT DEVICE AND SHALL NOT BE CONNECTED INTO WASTEWATER DISPOSAL SYSTEM.
3) PERIMETER DRAINAGE OR SUMP PUMPS FROM EXISTING RESIDENCE SHALL NOT BE CONNECTED INTO WASTEWATER DISPOSAL SYSTEM AND MUST NOT INFILTRATE OR DISCHARGE WITHIN 50' OF MOUND SYSTEM.
4) THIS DESIGN IS INTENDED TO TREAT NORMAL RESIDENTIAL WASTEWATER. IT IS NOT DESIGNED TO TREAT WASTEWATER CONTAINING SALTS, SOLVENTS OR HAZARDOUS CHEMICALS. THE USE OF CHEMOTHERAPEUTIC OR HEAVY PRESCRIPTION DRUGS CAN HAVE SERIOUS DETRIMENTAL IMPACTS ON THE LIFE OF THE SYSTEM.
5) EXCESSIVE FLOWS FROM LEAKING FIXTURES, RISERS, TANKS, OR OVER OCCUPANCY INVALIDATE THIS DESIGN.
6) NO PRIVATE WATER SUPPLY WELL OR SUCTION LINE SHALL BE LOCATED WITHIN 50 FEET OF THE SEPTIC TANK OR WITHIN 100 FEET OF THE WASTEWATER DISPOSAL SYSTEM.
7) FINISHED GRADE ABOVE THE LEACHING AREA SHALL HAVE A MINIMUM SLOPE OF 2% AND ALL SITE GRADING IS TO BE DONE IN A MANNER THAT PREVENTS THE COLLECTION OF SURFACE WATER.
8) EFFLUENT FILTER TO BE INSTALLED IN SEPTIC TANK OUTLET TEE, WHICH MUST REMAIN IN PLACE AND BE MAINTAINED AS REQUIRED TO MAINTAIN FLOW AND VENTING.
9) EFFLUENT FILTER TO BE MAINTAINED AS PER MANUFACTURER SPECIFICATIONS. THE FILTER WILL CLOG IF NOT PERIODICALLY CLEANED.
10) OWNER MUST FOLLOW SECTION 31.0, OPERATIONS AND MAINTENANCE OF PRESBY VERMONT DESIGN AND INSTALLATION MANUAL (SEPTEMBER 2019).



DISTRIBUTION PIPING & VENT MANIFOLD DETAIL
NOT TO SCALE

CONSTRUCTION NOTES:
1) CONTRACTOR MUST REVIEW THE PLAN AND PERFORM FIELD LAYOUT OF THE LOCATIONS AND ELEVATIONS OF EXISTING AND PROPOSED COMPONENTS AND INFORM THE ENGINEER OF ANY CONFLICTS PRIOR TO CONSTRUCTION. ALL CONNECTIONS TO EXISTING COMPONENTS MUST BE EXPOSED AND COORDINATED PRIOR TO CONSTRUCTION.
2) THE PRESBY SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND UNDER INSTRUCTION AND GUIDANCE OF AN INSTALLER/ INSPECTOR TRAINED BY THE MANUFACTURER. ALL APPLICABLE SECTIONS OF THE MOST RECENT PRESBY VERMONT DESIGN AND INSTALLATION MANUAL.
3) CONTRACTOR MUST RECEIVE AND READ WASTEWATER PERMIT FROM THE STATE PRIOR TO BEGINNING CONSTRUCTION.
4) CUT ALL SITE VEGETATION FLUSH TO GROUND, PLOW AREA SHOWN TO 8" DEPTH, WITHIN LIMITS OF FILL. PLOW PARALLEL WITH CONTOURS, CASTING SOIL UPSLOPE. TILLING OF GROUND WITH BUCKET TEETH IS ACCEPTABLE, IF DONE IN THE SAME MANNER.
5) PLOWING OR CONSTRUCTION OF MOUND AREA MAY NOT TAKE PLACE IN HIGH MOISTURE CONTENT CONDITIONS.
6) NO EQUIPMENT SHALL TRACK ON PLOWED SURFACE UNTIL 12" OF SAND FILL HAS BEEN PLACED OVER PLOWED SURFACE.
7) ALL TREES WITHIN 10' OF TOE OF FILL MUST BE CUTOFF AT THE BASE EXCEPT WHERE NOTED, EXERCISE CARE TO MINIMIZE DISTURBANCE OF THE SOIL LAYERS.
8) PRESBY SYSTEM SAND MUST BE ASTM C–33, (VT MOUND TYPE 2) WITH LESS THAN 3% PASSING THE #200 SIEVE, AND MUST BE PLACED 12" UNDER, 6" OVER AND 12" ON ALL SIDES OF PRESBY ADVANCED ENVIRO–SEPTIC PIPE OR ENVIRO–SEPTIC PIPE. PROVIDE SYSTEM SAND EXTENSION IF SHOWN. REMAINDER OF MOUND SAND FILL MUST MEET ANY OF THE THREE VT MOUND SAND SPECS SHOWN.
9) FROM HOUSE TO SEPTIC TANK USE 4" SCH. 40 PVC BUILDING SEWER, FROM SEPTIC TANK TO RAISED SYSTEM USE SCH 40 PVC. FOLLOW INVERT ELEVATIONS, MINIMUM AND MAXIMUM SLOPES ON PLANS, FOLLOW DETAILS FOR ALL INSTALLATIONS. PVC JOINTS TO BE SOLVENT WELDED.
10) PRESBY ENVIRO–SEPTIC SYSTEM IS DESIGNED TO BE VENTED FROM THE FINAL VENT THROUGH THE ROOF VENT OF THE HOUSE. ALL 'TRAPS' OR OBSTRUCTIONS THAT WOULD HINDER VENTING OF THE LEACHING SYSTEM MUST BE AVOIDED, AND REMOVED FROM SYSTEM
11) COVER OVER RAISED SYSTEM LINE TO BE 2" MINUS MATERIAL, FREE OF ALL LARGE STONES.
12) AT LEAST 72 HOURS BEFORE PLACING SAND FILL OVER PLOWED AREA, NOTIFY ENGINEER FOR INSPECTION. AT LEAST 72 HOURS BEFORE FINAL INSPECTION OF ENTIRE SYSTEM, CONTACT ENGINEER AND SEPTIC OFFICER FOR INSPECTION. CONTRACTOR TO SUPPLY ALL WATER FOR TESTING IF REQUIRED.
13) LOAM, SEED & MULCH ALL DISTURBED AREAS. PROVIDE EROSION CONTROL AS REQUIRED. FOLLOW EROSION CONTROL PLAN IF ONE EXISTS FOR PROJECT.
14) CERTIFICATION FORM, PROVIDED BY ENGINEER, STATING THAT SYSTEM WAS INSTALLED ACCORDING TO PLANS (AND OTHER DIRECTIVE FROM ENGINEER) WILL BE COMPLETED BY THE ENGINEER. CONSTRUCTION NOT IN ACCORDANCE WITH PLANS OR ENGINEER'S DIRECTIVES WILL NOT BE APPROVED, AND COULD RESULT IN REMOVAL AND REINSTALLATION TO MEET PROJECT PLANS AND DIRECTIVES.
15) CONTACT ENGINEER WITH ANY CONFLICTS AS SOON AS THEY ARE EVIDENT, PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY CHANGES MUST BE APPROVED BY ENGINEER IN WRITING.
16) LOCATION OF DISPOSAL SYSTEM AND WELL WILL BE STAKED AND LABELED IN THE FIELD. CONTRACTOR TO CONFIRM THAT THE LOCATIONS OF STAKES ARE ACCURATE AND IMMEDIATELY REPORT ANY CONFLICTS TO ENGINEER PRIOR TO COMMENCING CONSTRUCTION. NO UNNECESSARY DISTURBANCE OR STORAGE OF MATERIALS IS ALLOWED IN THE DISPOSAL FIELD AREA. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE STAKES, AND TEMPORARY BENCHMARK IN THEIR ORIGINAL POSITIONS AS STAKED OUT BY THE ENGINEER.
17) CONTRACTOR IS TO COMPLETE AND MAIL COPY OF SYSTEM INSTALLATION FORM (APPENDIX A) TO PRESBY ENVIRONMENTAL, INC.
18) THE CONTRACTOR SHALL PROVIDE THE ENGINEER WITH A COPY OF THE SIEVE ANALYSIS REPRESENTING THE MOUND SAND AND PRESBY SYSTEM SAND PROPOSED FOR USE IN THE SYSTEM CONSTRUCTION PRIOR TO COMMENCEMENT OF WORK FOR ENGINEER'S APPROVAL.
19) ESTIMATES OF FILL PROVIDED IN THIS PLAN ARE APPROXIMATE, IN PLACE VOLUMES. CONTRACTOR MUST COORDINATE AND CONFIRM ACTUAL VOLUME REQUIRED TO CONSTRUCT SYSTEM.
20) OWNER AND CONTRACTOR ARE REMINDED THAT PROJECT IS NOT COMPLETE UNTIL AN INSTALLATION CERTIFICATION LETTER IS OBTAINED. TRINITY CANNOT ISSUE THE INSTALLATION CERTIFICATION LETTER UNTIL THE WASTEWATER SYSTEM AND PROPOSED WELL ARE CONSTRUCTED IN ACCORDANCE WITH THE PLAN APPROVED BY THE VT DEC.

FINAL INSPECTION REQUIREMENTS AND PROCEDURE:
1) THE COST FOR ONE SITE VISIT TO COMPLETE THE FINAL INSPECTION HAS BEEN BILLED TO THE CLIENT. THE COST FOR PARTIAL OR INCOMPLETE FINAL INSPECTIONS MAY BE CHARGED DIRECTLY TO THE CONTRACTOR.
2) CONTRACTOR MUST BE PRESENT AT THE TIME OF INSPECTION AND MUST CONTACT THE LOCAL BOARD OF HEALTH OR SEPTIC OFFICER TO COORDINATE THEIR INSPECTION REQUIREMENTS.
3) THE ENTIRE SYSTEM MUST BE SUBSTANTIALLY CONSTRUCTED AND COMPLETELY TESTED BY THE CONTRACTOR PRIOR TO REQUESTING THE FINAL INSPECTION BY THE ENGINEER.
4) SUBSTANTIALLY CONSTRUCTED MEANS THE FOLLOWING:
   FOR ALL TYPES OF SYSTEMS:
   A. ALL COMPONENTS IN THE LEACH FIELD MUST BE INSTALLED, CONNECTED AND PROPERLY BEDDED.
   B. THE BUILDING SEWER MUST BE INSTALLED AND BEDDED AND AT LEAST PARTIALLY VISIBLE TO ALLOW INSPECTION OF THE CLASS OF PIPE AND BEDDING MATERIALS.
   C. THE SEPTIC TANK MUST BE INSTALLED AND BACKFILLED TO THE HEIGHT OF THE BOTTOM OF THE INLET AND OUTLET PIPES TO ALLOW INSPECTION OF THE PENETRATION SEALS. THE INLET TEE, OUTLET TEE, EFFLUENT TEE FILTER MUST BE INSTALLED. ALL RISERS MUST BE COMPLETELY INSTALLED AND AT FINISHED GRADE. ALL PENETRATIONS MUST BE SEALED.
   D. IF THE DESIGN CALLS FOR A PUMP CHAMBER, IT MUST BE INSTALLED AND BACKFILLED TO THE LEVEL OF THE BOTTOM OF THE PIPE PENETRATIONS. ALL PUMPS, PIPES, SEALS, CABLES, FLOATS, JUNCTION BOXES, ALARMS, RISERS AND COVERS MUST BE FULLY INSTALLED, AND COMPLETELY OPERATIONAL. PROVISIONS TO TEST THE PUMP SYSTEM WITH WATER WILL BE REQUIRED. CONTRACTOR MUST HAVE WATER LEVEL AT THE "PUMP OFF" LEVEL PRIOR TO INSPECTION, AND MUST HAVE SUFFICIENT WATER AVAILABLE TO TEST PUMP AS MANY TIME AS WILL BE NECESSARY.
   E. THE CONTRACTOR MUST PROVIDE TIE DISTANCES TO ALL COMPONENTS INCLUDING, BUILDING SEWERS, BENDS, TANKS, PUMP CHAMBERS, DISTRIBUTION BOXES AND FIELD CORNERS. THESE TIE DISTANCES SHOULD BE COMPLETED PRIOR TO THE FINAL INSPECTION.
   FOR RAISED PRESBY SYSTEMS:
   A. THE MOUND SAND AND SYSTEM SAND MUST BE INSTALLED IN THE MOUND, INCLUDING THE 6" DEPTH OF SYSTEM SAND OVER THE TOPS OF THE PRESBY PIPES. LEAVE ONLY THE TOP OF END CAPS AND CONNECTING PIPES VISIBLE FOR INSPECTION.
   B. ALL FILL MUST BE PLACED IN THE FILL SLOPES, INCLUDING ALL SAND, COMMON FILL AND TOPSOIL. CONTRACTOR MUST LEAVE THE TOP OF THE SYSTEM SAND UNCOVERED FOR INSPECTION. UPGRADIENT SURFACE DRAINAGE MUST BE INSTALLED.
   C. ALL VENT LINES MUST BE INSTALLED.
   D. THE CONTRACTOR MUST HAVE SIEVE ANALYSIS REPORTS FOR THE MOUND SAND AND THE SYSTEM SAND ON HAND AT THE TIME OF THE INSPECTION. THE SIEVE ANALYSIS REPORT MUST IDENTIFY THE SUPPLIER, AND THE DATE OF THE ANALYSIS.
5) ALL OTHER SITE SPECIFIC REQUIREMENTS IDENTIFIED ON THE DRAWING MUST BE COMPLETED, INCLUDING (IF APPLICABLE) ABANDONMENT OF EXISTING FAILED SYSTEMS, ABANDONMENT OF EXISTING WELLS, INSTALLATION OF CURTAIN DRAINS.
6) IF DEFICIENCIES ARE FOUND, THESE WILL BE NOTED AND THE INSPECTION WILL BE CONSIDERED A PARTIAL INSPECTION. A SUBSEQUENT INSPECTION(S) WILL BE REQUIRED TO CONFIRM THE DEFICIENCIES HAVE BEEN CORRECTED. ALL COSTS FOR SUBSEQUENT INSPECTIONS WILL BE CHARGED DIRECTLY TO THE CLIENT.

MINIMUM SETBACKS TO NEW WATER SUPPLY

	DRILLED WELL	SHALLOW WELL
ROAD	25'	25'
DRIVEWAY	15'	15'
DOWNGRADIENT SEPTIC	100'	150'
UPGRADIENT SEPTIC	200'	500'
SEPTIC TANK	50'	75'
PROPERTY LINE	10'	10'
BUILDING	10'	10'

MINIMUM SETBACK DISTANCES TO SEPTIC SYSTEM

	DISPOSAL FIELD	SEPTIC TANK	SEWER LINE
LAKE AND POND (STANDING WATER)	50'	25'	25'
RIVERS AND STREAMS	50'	25'.	10'.
DRAINAGE SWALES, DITCHES	25'	–.–	–.–
MAIN OR MUNICIPLE WATER LINES	50'	50'	o
SERVICE WATER LINES	25'	25'	o
ROADWAYS, DRIVES, PARKING LOTS	10'	5'	o
TOP OF SLOPE, OR SLOPE > 30%	25'	10'	10'
PROPERTY LINES	25'	10'	10'
TREES	10'	10'	10'
OTHER DISPOSAL FIELD	10'	–.–	–.–
FOUNDATION, OR CURTAIN DRAINS	35'	10'	10'
SUCTION WATER LINE	100'	50'	50'

o– REFER TO ENVIRONMENTAL PROTECTION RULES, CHAPTER 1.

DESIGN CALCULATIONS:

DESIGN MEETS THE MINIMUM REQUIREMENTS OF VT DEC CHAPTER 1 RULES, APRIL 12, 2019.

FROM PRESBY SYSTEMS DESIGN MANUAL, VERMONT STATE ATTACHMENT

DESIGN FLOWRATE BASED ON	3	BEDROOM HOUSE AT (2 PERSONS/BEDROOM)	140	GPD =	420 GAL/DAY
	1	BEDROOM HOUSE AT (1 PERSONS/BEDROOM)	70	GPD =	70 GAL/DAY
				TOTAL GPD =	490 GAL/DAY

SITE SLOPE IS	2.0	%	(NOTE: SLOPE OF EXISTING GROUND SURFACE)	
SYSTEM SLOPE IS	2.0	%	(NOTE: SLOPE OF PROPOSED DISPOSAL SYSTEM)	
SYSTEM SPACING	1.50	LF	(NOTE: THIS IS THE CENTER TO CENTER SPACING OF THE ENVIRO-SEPTIC LEACHING PIPE)	
LENGTH OF PIPES	60	LF	(NOTE: FOLLOW PLANS FOR ALL PIPE CONNECTION DETAILS)	
NUMBER OF ROWS	6	EACH		
TOTAL LF PROVIDED	360	LF	245	LF REQUIRED
MINIMUM AREA REQ	613	SF	661	SF PROVIDED (BASED ON MINIMUM OF 50% OF VT PIPE AND STONE SYSTEM)

SEPTIC TANK SIZE TO BE MINIMUM OF 1000 GALLONS REQUIRED, USE EFFLUENT TEE FILTER, USE 1500 GALLON SEPTIC TANK.

OTHER DESIGN NOTES:
1) NO GARBAGE DISPOSAL SHALL BE USED, NO WATER SOFTNER SHALL BE INSTALLED.
2) GROUNDWATER FOUND AT 24 THEREFORE PRESCRIPTIVE APPROACH IS USED.
3) SYSTEM MUST BE INSTALLED AND OPERATED IN ACCORDANCE WITH PRESBY DESIGN AND INSTALLATION MANUAL, AND THE VT STATE ATTACHMENT.
4) DESIGN IS BASED ON A MINIMUM OF 12 INCHES OF SAND UNDER PRESBY PIPES.
5) SYSTEM MUST BE INSTALLED AND OPERATED IN ACCORDANCE WITH PRESBY DESIGN AND INSTALLATION MANUAL, AND THE VT STATE ATTACHMENT (SEPTEMBER 2019).
6) SYSTEM IS DESIGNED TO TREAT WASTEWATER EFFLUENT FROM A RESIDENTIAL HOME, THE ADDITION OF ABUSIVE SUBSTANCES, ADDITIVES AND CONSTANT DISCHARGE OF WATER ARE DETRIMENTAL TO THE SYSTEM.

INVERT AND SURFACE ELEVATIONS

FOUNDATION WALL	757.33	USE 1/4"/FT MIN.
SEPTIC TANK INLET	756.87	MIN. ELEV.
SEPTIC TANK OUTLET	756.62	MIN. ELEV.
INVERT OF D–BOX OUTLET	755.75	MIN. ELEV.
INVERT OF 4" INLET TO ENVIRO–SEPTIC PIPE	755.58	MIN. ELEV.
ELEV. OF HIGHEST E–S PIPE BOTTOM	755.00	MIN. ELEV.
ELEV. OF SECOND E–S PIPE BOTTOM	754.97	MIN. ELEV.
ELEV. OF THIRD E–S PIPE BOTTOM	754.94	MIN. ELEV.
ELEV. OF FORTH E–S PIPE BOTTOM	754.91	MIN. ELEV.
ELEV. OF FIFTH E–S PIPE BOTTOM	754.88	MIN. ELEV.
ELEV. OF LOWEST E–S PIPE BOTTOM	754.85	MIN. ELEV.
FINISHED GRADE @ HIGHEST CORNERS	757.57	MIN. ELEV.
FINISHED GRADE @ LOWEST CORNERS	757.28	MIN. ELEV.

*NOTE:
SAND VOLUMES SHOWN ARE "IN–PLACE" VOLUMES. CONTRACTOR MUST ACCOUNT FOR SWELL/COMPACTION OF SAND, MEASUREMENT METHOD AT TIME OF PURCHASE AND ANY WASTE IN HANDLING/PLACEMENT ON SITE.

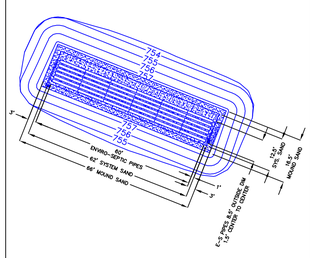
MOUND SAND FILL MUST MEET ONE OF THESE SPECIFICATIONS

TYPE 1 SAND FILL	TYPE 2* (ASTM C–33) PRESBY SYSTEM SAND	TYPE 2 (ASTM C–33) SAND FILL	TYPE 3 SAND FILL
NO. 3/8 85–100%	NO. 4 95–100%	NO. 4 95–100%	NO. 3/8 85–100%
NO. 40 25–75%	NO. 8 80–100%	NO. 8 80–100%	NO. 40 30–50%
NO. 60 0–30%	NO. 16 50–85%	NO. 16 50–85%	NO. 200 0–5%
NO. 100 0–10%	NO. 30 25–60%	NO. 30 25–60%	
NO. 200 0–5%	NO. 50 10–30%	NO. 50 10–30%	
	NO. 100 2–10%	NO. 100 2–10%	
	*NO. 200 0–3%	*NO. 200 0–5%	

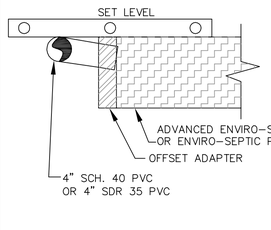
*ADDITIONAL SAND REQUIREMENT FOR USE AS PRESBY SYSTEM SAND. IF TYPE 2 SAND IS USED FOR SAND FILL THAN NO MORE THAN 3% SHALL PASS A 200 SIEVE.

A SIEVE ANALYSIS OF PROPOSED SAND SOURCES MUST BE SUBMITTED PRIOR TO CONSTRUCTION, FOR APPROVAL. NO LIMESTONE BASED SAND ALLOWED.

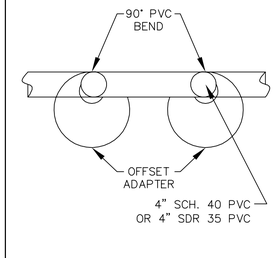
SYSTEM DIMENSIONS
NOT TO SCALE



SIDE VIEW
NOT TO SCALE



END VIEW
NOT TO SCALE



TRINITY ENGINEERING
TECHNICAL SERVICES, LLC
26 UNION STREET, SUITE 1D
NORTH ADAMS, MA 01247
(413) 398–3211 & (802) 694–1919

REV. NO.	DATE	DESCRIPTION	BY
1	7/7/22	ORIGINAL SUBMISSION FOR PERMIT	J.E.D.

STATE OF VERMONT CIVIL JOHN E. DUPRAS No. 7378 LICENSED PROFESSIONAL ENGINEER

DESIGNED BY: J.E.D.
DRAWN BY: G.J.V.
CHECKED BY: J.E.D.
SCALE: AS SHOWN

VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Drinking Water & Groundwater Protection Division
THIS IS SUBJECT TO PROVISIONS OR CONDITIONS LISTED IN PERMIT
Permit #: WW-8-0814-1
Date: 08/05/2022

TITLE: THE STATE OF VERMONT WASTEWATER DISPOSAL SYSTEM AND POTABLE WATER SUPPLY DESIGN

PROJECT: PREPARED FOR BRIAN O'NEIL NORTH POWNAL ROAD TOWN OF POWNAL, VERMONT

DATE: 7/7/2022

PROJECT NUMBER: 22086

SHEET NUMBER: C-2

SHEET: 2 OF 2

APPENDIX D

ANALYTICAL REPORT

Lab Number:	L2354151
Client:	Weston & Sampson 98 South Main Street Suite 2 Waterbury, VT 05676
ATTN:	Lee Rosberg
Phone:	(802) 613-4106
Project Name:	VTDEC-QUARRY HILL ROAD
Project Number:	ENG23-0864
Report Date:	09/29/23

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0825), DoD (L2474), FL (E87814), IL (200081), IN (C-MA-04), KY (KY98046), LA (85084), ME (MA00030), MD (350), MI (99110) , NJ (MA015), NY (11627), NC (685), OH (CL106), OR (MA-0262), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #525-23-107-88708), 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: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2354151
Report Date: 09/29/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2354151-01	583 QUARRY HILL ROAD 230913	DW	POWNAL, VERMONT	09/13/23 10:47	09/15/23
L2354151-02	581 QUARRY HILL ROAD 230913	DW	POWNAL, VERMONT	09/13/23 11:17	09/15/23
L2354151-03	1522 NORTH POWNAL ROAD 230913	DW	POWNAL, VERMONT	09/13/23 12:08	09/15/23
L2354151-04	990 NORTH POWNAL ROAD 230913	DW	POWNAL, VERMONT	09/13/23 12:41	09/15/23
L2354151-05	431 QUARRY HILL ROAD 230913	DW	POWNAL, VERMONT	09/13/23 13:03	09/15/23
L2354151-06	871 NORTH POWNAL ROAD 230913	DW	POWNAL, VERMONT	09/13/23 13:29	09/15/23
L2354151-07	DUP	DW	POWNAL, VERMONT	09/13/23 00:00	09/15/23
L2354151-08	FIELD BLANK	DW	POWNAL, VERMONT	09/13/23 00:00	09/15/23
L2354151-09	717 NORTH POWNAL ROAD 230914	DW	POWNAL, VERMONT	09/14/23 08:00	09/15/23
L2354151-10	737 MOUNT ANTHONY ROAD 230914	DW	POWNAL, VERMONT	09/14/23 08:45	09/15/23
L2354151-11	320 QUARRY HILL ROAD 23914	DW	POWNAL, VERMONT	09/14/23 09:31	09/15/23

Project Name:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2354151
Project Number:	ENG23-0864	**Report Date:**	09/29/23

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:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2354151
Project Number:	ENG23-0864	**Report Date:**	09/29/23

Case Narrative (continued)

Perfluorinated Alkyl Acids by EPA 533

L2354151-02: The analysis of PFAAs via EPA 533 was canceled.

L2354151-01, -06, and -07: The sample has a detection that exceeds the Maximum Contaminant Level (MCL).

L2354151-08: The extracted internal standard recoveries were outside the acceptance criteria for perfluoro[13c4]butanoic acid (mpfba) (44%) and 2,3,3,3-tetrafluoro-2-[1,1,2,2,3,3,3-heptafluoropropoxy]-13c3-propanoic acid (m3hfpo-da) (47%); however, re-extraction could not be performed due to lack of additional sample. The results of the original analysis are reported.

WG1830596-3: The Matrix Spike level is at the Reporting Limit (RL); any detections below the RL in the native sample are not included in the % Recovery calculation.

The WG1830596-3 MS recoveries, performed on L2354151-01, are outside the acceptance criteria for perfluorohexanoic acid (pfhxa) (169%), 2,3,3,3-tetrafluoro-2-[1,1,2,2,3,3,3-heptafluoropropoxy]-propanoic acid (hfpo-da) (221%), perfluorohexanesulfonic acid (pfhxs) (205%), perfluorooctanoic acid (pfoa) (164%) and perfluorononanoic acid (pfna) (154%).

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:  Alycia Mogayzel

Title: Technical Director/Representative Date: 09/29/23

ORGANICS

SEMIVOLATILES

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-01
Client ID: 583 QUARRY HILL ROAD 230913
Sample Location: POWNAL, VERMONT

Date Collected: 09/13/23 10:47
Date Received: 09/15/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 09/24/23 20:13
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	30.7		ng/l	1.76	--	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.76	--	1
Perfluoropentanoic Acid (PFPeA)	11.0		ng/l	1.76	--	1
Perfluorobutanesulfonic Acid (PFBS)	5.11		ng/l	1.76	--	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.76	--	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.76	--	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.76	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.76	--	1
Perfluorohexanoic Acid (PFHxA)	13.9		ng/l	1.76	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.76	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.76	--	1
Perfluoroheptanoic Acid (PFHpA)	16.7		ng/l	1.76	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.76	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.76	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.76	--	1
Perfluorooctanoic Acid (PFOA)	161		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)	2.69		ng/l	1.76	--	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.76	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.76	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.76	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.76	--	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.76	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.76	--	1
PFAS, Total (6)	180		ng/l	1.76	--	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-01 Date Collected: 09/13/23 10:47

Client ID: 583 QUARRY HILL ROAD 230913 Date Received: 09/15/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	95		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	67		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	68		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	137		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	75		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	86		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	81		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	87		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	139		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	89		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	84		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	100		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	137		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	105		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	113		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	71		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-03
Client ID: 1522 NORTH POWNAL ROAD 230913
Sample Location: POWNAL, VERMONT

Date Collected: 09/13/23 12:08
Date Received: 09/15/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 09/24/23 20:48
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.88	--	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.88	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.88	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.88	--	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.88	--	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.88	--	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.88	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.88	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.88	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.88	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.88	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.88	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.88	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.88	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.88	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.88	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.88	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.88	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.88	--	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.88	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.88	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.88	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.88	--	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.88	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.88	--	1
PFAS, Total (6)	ND		ng/l	1.88	--	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-03 Date Collected: 09/13/23 12:08

Client ID: 1522 NORTH POWNAL ROAD 230913 Date Received: 09/15/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	102		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	106		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	102		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	101		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	95		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	94		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	92		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	101		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	98		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	94		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	93		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	89		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	106		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	94		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	98		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	94		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-04
Client ID: 990 NORTH POWNAL ROAD 230913
Sample Location: POWNAL, VERMONT

Date Collected: 09/13/23 12:41
Date Received: 09/15/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 09/24/23 20:57
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.84	--	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.84	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.84	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.84	--	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.84	--	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.84	--	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	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
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.84	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.84	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.84	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.84	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.84	--	1
Perfluorooctanoic Acid (PFOA)	11.7		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)	2.33		ng/l	1.84	--	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.84	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.84	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.84	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.84	--	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.84	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.84	--	1
PFAS, Total (6)	14.0		ng/l	1.84	--	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-04 Date Collected: 09/13/23 12:41

Client ID: 990 NORTH POWNAL ROAD 230913 Date Received: 09/15/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	88		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	84		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	84		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	112		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	86		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	89		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	90		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	84		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	103		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	94		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	92		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	94		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	101		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	100		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	101		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	87		50-200

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2354151
Report Date: 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-05
Client ID: 431 QUARRY HILL ROAD 230913
Sample Location: POWNAL, VERMONT

Date Collected: 09/13/23 13:03
Date Received: 09/15/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 09/24/23 21:05
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.85	--	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.85	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.85	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.85	--	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.85	--	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.85	--	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.85	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.85	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.85	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.85	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.85	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.85	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.85	--	1
Perfluorooctanoic Acid (PFOA)	2.24		ng/l	1.85	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.85	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.85	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.85	--	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.85	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.85	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.85	--	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.85	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.85	--	1
PFAS, Total (6)	2.24		ng/l	1.85	--	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-05 Date Collected: 09/13/23 13:03

Client ID: 431 QUARRY HILL ROAD 230913 Date Received: 09/15/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	55		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	55		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	87		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	95		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	53		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	51		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	81		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	62		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	90		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	64		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	77		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	62		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	84		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	66		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	68		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	50		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-06
Client ID: 871 NORTH POWNAL ROAD 230913
Sample Location: POWNAL, VERMONT

Date Collected: 09/13/23 13:29
Date Received: 09/15/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 09/24/23 21:14
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.85	--	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.85	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.85	--	1
Perfluorobutanesulfonic Acid (PFBS)	8.72		ng/l	1.85	--	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.85	--	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.85	--	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.85	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.85	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.85	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.85	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.85	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.85	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	2.08		ng/l	1.85	--	1
Perfluorooctanoic Acid (PFOA)	30.4		ng/l	1.85	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.85	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.85	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.85	--	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.85	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.85	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.85	--	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.85	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.85	--	1
PFAS, Total (6)	30.4		ng/l	1.85	--	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-06 Date Collected: 09/13/23 13:29

Client ID: 871 NORTH POWNAL ROAD 230913 Date Received: 09/15/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	85		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	80		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	85		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	97		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	84		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	80		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	90		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	76		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	95		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	83		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	89		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	80		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	93		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	77		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	76		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	88		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-07
Client ID: DUP
Sample Location: POWNAL, VERMONT

Date Collected: 09/13/23 00:00
Date Received: 09/15/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 09/24/23 21:23
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	28.9		ng/l	1.78	--	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.78	--	1
Perfluoropentanoic Acid (PFPeA)	12.0		ng/l	1.78	--	1
Perfluorobutanesulfonic Acid (PFBS)	4.80		ng/l	1.78	--	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.78	--	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.78	--	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.78	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.78	--	1
Perfluorohexanoic Acid (PFHxA)	13.6		ng/l	1.78	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.78	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.78	--	1
Perfluoroheptanoic Acid (PFHpA)	15.8		ng/l	1.78	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.78	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.78	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.78	--	1
Perfluorooctanoic Acid (PFOA)	154		ng/l	1.78	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.78	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.78	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.78	--	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.78	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.78	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.78	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.78	--	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.78	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.78	--	1
PFAS, Total (6)	170		ng/l	1.78	--	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-07 Date Collected: 09/13/23 00:00

Client ID: DUP Date Received: 09/15/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	99		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	67		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	76		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	143		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	83		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	91		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	81		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	87		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	155		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	88		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	81		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	92		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	136		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	94		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	84		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	71		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-08
Client ID: FIELD BLANK
Sample Location: POWNAL, VERMONT

Date Collected: 09/13/23 00:00
Date Received: 09/15/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 09/24/23 21:32
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.85	--	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.85	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.85	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.85	--	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.85	--	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.85	--	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.85	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.85	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.85	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.85	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.85	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.85	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.85	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.85	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.85	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.85	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.85	--	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.85	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.85	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.85	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.85	--	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.85	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.85	--	1
PFAS, Total (6)	ND		ng/l	1.85	--	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-08 Date Collected: 09/13/23 00:00

Client ID: FIELD BLANK Date Received: 09/15/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	**44**	Q	50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	50		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	101		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	51		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	54		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	94		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	62		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	101		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	68		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	80		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	67		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	90		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	62		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	58		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	**47**	Q	50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-09
Client ID: 717 NORTH POWNAL ROAD 230914
Sample Location: POWNAL, VERMONT

Date Collected: 09/14/23 08:00
Date Received: 09/15/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 09/24/23 21:40
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.77	--	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.77	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.77	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.77	--	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.77	--	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.77	--	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.77	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.77	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.77	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.77	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.77	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.77	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.77	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.77	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.77	--	1
Perfluorooctanoic Acid (PFOA)	13.1		ng/l	1.77	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.77	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.77	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.77	--	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.77	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.77	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.77	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.77	--	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.77	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.77	--	1
PFAS, Total (6)	13.1		ng/l	1.77	--	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-09 Date Collected: 09/14/23 08:00

Client ID: 717 NORTH POWNAL ROAD 230914 Date Received: 09/15/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	90		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	85		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	83		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	99		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	88		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	85		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	90		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	94		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	85		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	75		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	80		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	84		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	73		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	71		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	87		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-10
Client ID: 737 MOUNT ANTHONY ROAD 230914
Sample Location: POWNAL, VERMONT

Date Collected: 09/14/23 08:45
Date Received: 09/15/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 09/24/23 21:49
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.80	--	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.80	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.80	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.80	--	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.80	--	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.80	--	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.80	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.80	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.80	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.80	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.80	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.80	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.80	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.80	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.80	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.80	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.80	--	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.80	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.80	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.80	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.80	--	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.80	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.80	--	1
PFAS, Total (6)	ND		ng/l	1.80	--	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-10 Date Collected: 09/14/23 08:45

Client ID: 737 MOUNT ANTHONY ROAD 230914 Date Received: 09/15/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	87		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	85		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	92		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	93		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	78		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	76		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	89		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	81		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	91		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	85		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	83		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	75		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	89		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	68		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	67		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	81		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-11
Client ID: 320 QUARRY HILL ROAD 23914
Sample Location: POWNAL, VERMONT

Date Collected: 09/14/23 09:31
Date Received: 09/15/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 09/24/23 22:07
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.81	--	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.81	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.81	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.81	--	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.81	--	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.81	--	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.81	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.81	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.81	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.81	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.81	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.81	--	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.81	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.81	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.81	--	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.81	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.81	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.81	--	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.81	--	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.81	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.81	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.81	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.81	--	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.81	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.81	--	1
PFAS, Total (6)	ND		ng/l	1.81	--	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

SAMPLE RESULTS

Lab ID: L2354151-11 Date Collected: 09/14/23 09:31

Client ID: 320 QUARRY HILL ROAD 23914 Date Received: 09/15/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	91		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	90		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	95		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	95		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	97		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	104		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	94		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	95		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	83		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	89		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	89		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	81		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	80		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	101		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2354151

Project Number: ENG23-0864 **Report Date:** 09/29/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 136,533
Analytical Date: 09/24/23 19:56
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01,03-11 Batch: WG1830596-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	--
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	2.00	--
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	--
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	--
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	2.00	--
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	2.00	--
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	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	--
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	2.00	--
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	--
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	--
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	--
Perfluorooctanoic Acid (PFOA)	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	--
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	--
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	--
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	--
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	2.00	--
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	--

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2354151
Report Date: 09/29/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 136,533
Analytical Date: 09/24/23 19:56
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 09/22/23 06:55

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01,03-11 Batch: WG1830596-1					
PFAS, Total (6)	ND		ng/l	2.00	--

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	97		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	103		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	97		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	93		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	96		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	96		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	94		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	105		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	107		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	100		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	101		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	103		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	128		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	107		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	112		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	101		50-200

Lab Control Sample Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2354151
Report Date: 09/29/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01,03-11 Batch: WG1830596-2								
Perfluorobutanoic Acid (PFBA)	108		-		50-150	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	113		-		50-150	-		30
Perfluoropentanoic Acid (PFPeA)	105		-		50-150	-		30
Perfluorobutanesulfonic Acid (PFBS)	91		-		50-150	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	95		-		50-150	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	94		-		50-150	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	89		-		50-150	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	106		-		50-150	-		30
Perfluorohexanoic Acid (PFHxA)	110		-		50-150	-		30
Perfluoropentanesulfonic Acid (PFPeS)	104		-		50-150	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	107		-		50-150	-		30
Perfluoroheptanoic Acid (PFHpA)	106		-		50-150	-		30
Perfluorohexanesulfonic Acid (PFHxS)	98		-		50-150	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	108		-		50-150	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	98		-		50-150	-		30
Perfluorooctanoic Acid (PFOA)	117		-		50-150	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	101		-		50-150	-		30
Perfluorononanoic Acid (PFNA)	103		-		50-150	-		30
Perfluorooctanesulfonic Acid (PFOS)	108		-		50-150	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	92		-		50-150	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	102		-		50-150	-		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2354151
Report Date: 09/29/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01,03-11 Batch: WG1830596-2								
Perfluorodecanoic Acid (PFDA)	101		-		50-150	-		30
Perfluoroundecanoic Acid (PFUnA)	102		-		50-150	-		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	92		-		50-150	-		30
Perfluorododecanoic Acid (PFDoA)	108		-		50-150	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	97				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	97				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	95				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	91				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	95				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	92				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	99				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	102				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	105				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	87				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	101				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	127				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	98				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	96				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	94				50-200

Matrix Spike Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2354151
Report Date: 09/29/23

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 EPA 533 - Mansfield Lab QUARRY HILL ROAD 230913	Associated sample(s): 01,03-11		QC Batch ID: WG1830596-3			QC Sample: L2354151-01			Client ID: 583			
Perfluorobutanoic Acid (PFBA)	30.7	1.83	32.4	93		-	-		50-150	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	1.83	ND	73		-	-		50-150	-		30
Perfluoropentanoic Acid (PFPeA)	11.0	1.83	13.5	137		-	-		50-150	-		30
Perfluorobutanesulfonic Acid (PFBS)	5.11	1.63	6.30	73		-	-		50-150	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	1.83	2.52	138		-	-		50-150	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	1.63	ND	104		-	-		50-150	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	1.83	ND	98		-	-		50-150	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	1.72	2.05	119		-	-		50-150	-		30
Perfluorohexanoic Acid (PFHxA)	13.9	1.83	17.0	**169**	Q	-	-		50-150	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	1.72	ND	103		-	-		50-150	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	1.83	4.04	**221**	Q	-	-		50-150	-		30
Perfluoroheptanoic Acid (PFHpA)	16.7	1.83	17.7	55		-	-		50-150	-		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	1.67	3.42	**205**	Q	-	-		50-150	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	1.73	ND	104		-	-		50-150	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	1.74	2.13	122		-	-		50-150	-		30
Perfluorooctanoic Acid (PFOA)	161	1.83	164	**164**	Q	-	-		50-150	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	1.75	ND	101		-	-		50-150	-		30
Perfluorononanoic Acid (PFNA)	ND	1.83	2.82	**154**	Q	-	-		50-150	-		30
Perfluorooctanesulfonic Acid (PFOS)	2.69	1.7	4.58	111		-	-		50-150	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	1.71	ND	99		-	-		50-150	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	1.76	1.84	105		-	-		50-150	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD

Project Number: ENG23-0864

Lab Number: L2354151

Report Date: 09/29/23

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 EPA 533 - Mansfield Lab Associated sample(s): 01,03-11 QC Batch ID: WG1830596-3 QC Sample: L2354151-01 Client ID: 583 QUARRY HILL ROAD 230913												
Perfluorodecanoic Acid (PFDA)	ND	1.83	1.94	106		-	-		50-150	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	1.83	1.90	104		-	-		50-150	-		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	1.73	1.92	111		-	-		50-150	-		30
Perfluorododecanoic Acid (PFDoA)	ND	1.83	ND	96		-	-		50-150	-		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)	147				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	134				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	153				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	68				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	118				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	106				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	78				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	89				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	80				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	133				50-200
Perfluoro[13C4]Butanoic Acid (MPFBA)	94				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	69				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	95				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	89				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	94				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	74				50-200

Lab Duplicate Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2354151
Report Date: 09/29/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01,03-11 QC Batch ID: WG1830596-4 QC Sample: L2300080-120 Client ID: DUP Sample						
Perfluorobutanoic Acid (PFBA)	2.99	3.73	ng/l	22		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	ND	ng/l	NC		30
Perfluoropentanoic Acid (PFPeA)	1.79	2.15	ng/l	18		30
Perfluorobutanesulfonic Acid (PFBS)	1.98	2.20	ng/l	11		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	ND	ng/l	NC		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	ND	ng/l	NC		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/l	NC		30
Perfluorohexanoic Acid (PFHxA)	2.69	5.04	ng/l	**61**	Q	30
Perfluoropentanesulfonic Acid (PFPeS)	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
Perfluoroheptanoic Acid (PFHpA)	2.99	2.17	ng/l	**32**	Q	30
Perfluorohexanesulfonic Acid (PFHxS)	ND	ND	ng/l	NC		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/l	NC		30
Perfluorooctanoic Acid (PFOA)	19.0	18.6	ng/l	2		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/l	NC		30
Perfluorononanoic Acid (PFNA)	ND	ND	ng/l	NC		30
Perfluorooctanesulfonic Acid (PFOS)	6.06	6.52	ng/l	7		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	ND	ng/l	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2354151
Report Date: 09/29/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01,03-11 QC Batch ID: WG1830596-4 QC Sample: L2300080-120 Client ID: DUP Sample						
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/l	NC		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/l	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/l	NC		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	ND	ng/l	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/l	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	**10**	Q	67		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	**10**	Q	69		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	**11**	Q	60		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	**11**	Q	71		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	**9**	Q	59		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	**9**	Q	67		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	**11**	Q	63		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	**11**	Q	63		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**13**	Q	75		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	**13**	Q	75		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	**16**	Q	68		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	**16**	Q	72		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	**20**	Q	91		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	**19**	Q	76		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	**22**	Q	81		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	**10**	Q	59		50-200

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2354151
Report Date: 09/29/23

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(*)
L2354151-01A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-01B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-02A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		CANCELLED()
L2354151-02B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		CANCELLED()
L2354151-03A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-03B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-04A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-04B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-05A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-05B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-06A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-06B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-07A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-07B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-08A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-09A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-09B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-10A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-10B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-11A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)
L2354151-11B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.7	Y	Absent		A2-533(28)

*Values in parentheses indicate holding time in days

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2354151
Report Date: 09/29/23

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-Chloroeicosafluoro-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: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2354151
Report Date: 09/29/23

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:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2354151
Project Number:	ENG23-0864	**Report Date:**	09/29/23

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:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2354151
Project Number:	ENG23-0864	**Report Date:**	09/29/23

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:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2354151
Project Number:	ENG23-0864	**Report Date:**	09/29/23

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.)

Report Format: Data Usability Report

REFERENCES

136 Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). EPA Method 533, EPA Document 815-B-19-020, November 2019.

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 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 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 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, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
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, **LACHAT 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).
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

Date Rec'd in Lab: 9/15/23

ALPHA Job #: L2354151

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: Weston & Sampson
Address: 98 S. Main St, Waterbury, VT
Phone: 8026134106
Fax:
Email: Rosberg.Lee@wseinc.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: VTDEC-Quarry Hill Road
Project Location: Pownal, Vermont
Project #: ENG23-0864
Project Manager: Lee Rosberg
ALPHA Quote #:

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☑ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #: ENG23-0864
invoices@wseinc.com

Regulatory Requirements/Report Limits

State /Fed Program	Criteria
VT	VT Drinking Water MCL

Other Project Specific Requirements/Comments/Detection Limits:

ANALYSIS: EPA method 533

SAMPLE HANDLING

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

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials		Sample Specific Comments	TOTAL # BOTTLES
54151-01	583 Quarry Hill Road 230913	9/13	1047	DW	SRH	X		2
-02	581 Quarry Hill Road 230913	9/13	1117		SRH	X		
-03	1522 North Pownal Road 230913	9/13	1208		SRH	X		
-04	990 North Pownal Road 230913	9/13	1241		SRH	X		
-05	431 Quarry Hill Road 230913	9/13	1303		SRH	X		
-06	871 North Pownal Road 230913	9/13	1329		SRH	X		
-07	DUP	9/13	—		SRH	X		1
-08	Field Blank	9/13	—		SRH	X		2
-09	717 North Pownal Road 230914	9/14	800		SRH	X		2
-10	737 Mount Anthony Road 230914	9/14	845		SRH	X		

Container Type	P
Preservative	Ammonia Acetate

Relinquished By:	Date/Time	Received By:	Date/Time
FEDEX	9/14 1515	FEDEX	9/15/23 0909
	9/15/23 0909		

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.

FORM NO: 01-01 (rev. 14-OCT-07)

CHAIN OF CUSTODY

PAGE 2 OF 2

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Client Information

Client: Weston & Sampson
Address: 98 S. Main St, Waterbury VT
Phone: 8026134106
Fax:
Email: Rosberg.Lee@wseinc.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: VTDEC - Quarry Hill Road
Project Location: Pownal, Vermont
Project #: ENG23-0864
Project Manager: Lee Rosberg
ALPHA Quote #:

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: Time:

Other Project Specific Requirements/Comments/Detection Limits:

Date Rec'd in Lab:

Report Information - Data Deliverables

☐ FAX ☑ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #: ENG23-0864
invoices@wseinc.com

Regulatory Requirements/Report Limits

State /Fed Program	Criteria
VT	VT Drinking Water MCL

ALPHA Job #:

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ANALYSIS: EPA Method 533	SAMPLE HANDLING	TOTAL # BOTTLES
-01	320 Quarry Hill Road 230914	9/14	931	DW	SRH	X		2

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)
Sample Specific Comments

Container Type	P
Preservative	Ammonia Acetate

Relinquished By:	Date/Time	Received By:	Date/Time
FEDEX	9/15/23 0449	FEDEX	9/15/23 0449

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.

FORM NO: 01-01 (rev. 14-OCT-07)

ORIGIN ID:MVLA (802) 560-4111
SHIPPING MANAGER
PACK & SEND PLUS
39 N. MAIN ST
ON THE ROUNDABOUT
WATERBURY, VT 05676
UNITED STATES US

SHIP DATE: 14SEP23
ACTWGT: 43.60 LB
CAD: 254358558/WSXI3600
DIMS: 25x14x14 IN

BILL SENDER

TO SAMPLE RECEIVING
ALPHA ANALYTICAL INC.
320 FORBES BLVD

MANSFIELD MA 02048

REF: LEE ROSBERG
DEPT:
(508) 898-9220
INV: PKG ID: 96521
PO:

FedEx Express

FRI - 15 SEP 10:30A
PRIORITY OVERNIGHT

TRK# 0201 7837 7305 2935

02048
MA-US BOS

XE PYMA

ANALYTICAL REPORT

Lab Number:	L2364675
Client:	Weston & Sampson 98 South Main Street Suite 2 Waterbury, VT 05676
ATTN:	Lee Rosberg
Phone:	(802) 613-4106
Project Name:	VTDEC-QUARRY HILL ROAD
Project Number:	ENG23-0864
Report Date:	11/10/23

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0825), DoD (L2474), FL (E87814), IL (200081), IN (C-MA-04), KY (KY98046), LA (85084), ME (MA00030), MD (350), MI (99110) , NJ (MA015), NY (11627), NC (685), OH (CL106), OR (MA-0262), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #525-23-107-88708), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
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Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2364675
Report Date: 11/10/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2364675-01	581 QUARRY HILL ROAD 231030	DW	POWNAL, VERMONT	10/30/23 09:59	10/31/23
L2364675-02	871 NORTH POWNAL ROAD 231030	DW	POWNAL, VERMONT	10/30/23 09:26	10/31/23
L2364675-03	DUP 231030-1	DW	POWNAL, VERMONT	10/30/23 00:00	10/31/23
L2364675-04	FIELD BLANK	DW	POWNAL, VERMONT	10/30/23 00:00	10/31/23

Project Name:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2364675
Project Number:	ENG23-0864	**Report Date:**	11/10/23

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:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2364675
Project Number:	ENG23-0864	**Report Date:**	11/10/23

Case Narrative (continued)

Report Submission

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

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: Darian Dailey

Title: Technical Director/Representative Date: 11/10/23

ORGANICS

SEMIVOLATILES

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2364675
Report Date: 11/10/23

SAMPLE RESULTS

Lab ID: L2364675-01
Client ID: 581 QUARRY HILL ROAD 231030
Sample Location: POWNAL, VERMONT

Date Collected: 10/30/23 09:59
Date Received: 10/31/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 11/09/23 16:07
Analyst: CAP

Extraction Method: EPA 533
Extraction Date: 11/08/23 10:50

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	3.24		ng/l	1.74	0.580	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.74	0.580	1
Perfluoropentanoic Acid (PFPeA)	2.29		ng/l	1.74	0.580	1
Perfluorobutanesulfonic Acid (PFBS)	1.77		ng/l	1.74	0.580	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.74	0.580	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.74	0.580	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.74	0.580	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.74	0.580	1
Perfluorohexanoic Acid (PFHxA)	2.81		ng/l	1.74	0.580	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.74	0.580	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.74	0.580	1
Perfluoroheptanoic Acid (PFHpA)	2.58		ng/l	1.74	0.580	1
Perfluorohexanesulfonic Acid (PFHxS)	0.949	J	ng/l	1.74	0.580	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.74	0.580	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	1.99		ng/l	1.74	0.580	1
Perfluorooctanoic Acid (PFOA)	19.9		ng/l	1.74	0.580	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.74	0.580	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.74	0.580	1
Perfluorooctanesulfonic Acid (PFOS)	5.67		ng/l	1.74	0.580	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.74	0.580	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.74	0.580	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.74	0.580	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.74	0.580	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.74	0.580	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.74	0.580	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2364675

Project Number: ENG23-0864 **Report Date:** 11/10/23

SAMPLE RESULTS

Lab ID: L2364675-01 Date Collected: 10/30/23 09:59

Client ID: 581 QUARRY HILL ROAD 231030 Date Received: 10/31/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	96		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	82		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	105		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	123		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	90		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	85		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	94		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	90		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	121		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	97		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	105		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	88		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	133		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	96		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	97		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	81		50-200

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2364675
Report Date: 11/10/23

SAMPLE RESULTS

Lab ID: L2364675-02
Client ID: 871 NORTH POWNAL ROAD 231030
Sample Location: POWNAL, VERMONT

Date Collected: 10/30/23 09:26
Date Received: 10/31/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 11/09/23 16:16
Analyst: CAP

Extraction Method: EPA 533
Extraction Date: 11/08/23 10:50

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	1.03	J	ng/l	1.90	0.634	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.90	0.634	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.90	0.634	1
Perfluorobutanesulfonic Acid (PFBS)	3.24		ng/l	1.90	0.634	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.90	0.634	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.90	0.634	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.90	0.634	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.90	0.634	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.90	0.634	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.90	0.634	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.90	0.634	1
Perfluoroheptanoic Acid (PFHpA)	1.48	J	ng/l	1.90	0.634	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.90	0.634	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.90	0.634	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.896	J	ng/l	1.90	0.634	1
Perfluorooctanoic Acid (PFOA)	28.6		ng/l	1.90	0.634	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.90	0.634	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.90	0.634	1
Perfluorooctanesulfonic Acid (PFOS)	1.01	J	ng/l	1.90	0.634	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.90	0.634	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.90	0.634	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.90	0.634	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.90	0.634	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.90	0.634	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.90	0.634	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2364675

Project Number: ENG23-0864 **Report Date:** 11/10/23

SAMPLE RESULTS

Lab ID: L2364675-02 Date Collected: 10/30/23 09:26

Client ID: 871 NORTH POWNAL ROAD 231030 Date Received: 10/31/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	92		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	81		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	86		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	115		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	92		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	86		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	96		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	96		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	99		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	91		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	89		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	92		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	112		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	99		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	102		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	90		50-200

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2364675
Report Date: 11/10/23

SAMPLE RESULTS

Lab ID: L2364675-03
Client ID: DUP 231030-1
Sample Location: POWNAL, VERMONT

Date Collected: 10/30/23 00:00
Date Received: 10/31/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 11/09/23 16:33
Analyst: CAP

Extraction Method: EPA 533
Extraction Date: 11/08/23 10:50

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	0.981	J	ng/l	1.87	0.626	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.87	0.626	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.87	0.626	1
Perfluorobutanesulfonic Acid (PFBS)	2.97		ng/l	1.87	0.626	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.87	0.626	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.87	0.626	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.87	0.626	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.87	0.626	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.87	0.626	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.87	0.626	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.87	0.626	1
Perfluoroheptanoic Acid (PFHpA)	1.23	J	ng/l	1.87	0.626	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.87	0.626	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.87	0.626	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	1.02	J	ng/l	1.87	0.626	1
Perfluorooctanoic Acid (PFOA)	28.5		ng/l	1.87	0.626	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.87	0.626	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.87	0.626	1
Perfluorooctanesulfonic Acid (PFOS)	1.15	J	ng/l	1.87	0.626	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.87	0.626	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.87	0.626	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.87	0.626	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.87	0.626	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.87	0.626	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.87	0.626	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2364675

Project Number: ENG23-0864 **Report Date:** 11/10/23

SAMPLE RESULTS

Lab ID: L2364675-03 Date Collected: 10/30/23 00:00

Client ID: DUP 231030-1 Date Received: 10/31/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	91		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	78		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	89		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	103		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	78		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	80		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	85		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	71		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	106		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	86		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	89		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	79		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	110		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	88		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	85		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	74		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2364675

Project Number: ENG23-0864 **Report Date:** 11/10/23

SAMPLE RESULTS

Lab ID: L2364675-04
Client ID: FIELD BLANK
Sample Location: POWNAL, VERMONT

Date Collected: 10/30/23 00:00
Date Received: 10/31/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 11/09/23 16:42
Analyst: CAP

Extraction Method: EPA 533
Extraction Date: 11/08/23 10:50

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.95	0.652	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.95	0.652	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.95	0.652	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.95	0.652	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.95	0.652	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.95	0.652	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.95	0.652	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.95	0.652	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.95	0.652	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.95	0.652	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.95	0.652	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.95	0.652	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.95	0.652	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.95	0.652	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	1.22	J	ng/l	1.95	0.652	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.95	0.652	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.95	0.652	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.95	0.652	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.95	0.652	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.95	0.652	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.95	0.652	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.95	0.652	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.95	0.652	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.95	0.652	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.95	0.652	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2364675

Project Number: ENG23-0864 **Report Date:** 11/10/23

SAMPLE RESULTS

Lab ID: L2364675-04 Date Collected: 10/30/23 00:00

Client ID: FIELD BLANK Date Received: 10/31/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	95		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	84		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	88		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	87		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	87		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	88		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	80		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	84		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	84		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	88		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	85		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	94		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	105		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	94		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	96		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	83		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2364675

Project Number: ENG23-0864 **Report Date:** 11/10/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 136,533
Analytical Date: 11/09/23 14:22
Analyst: CAP

Extraction Method: EPA 533
Extraction Date: 11/08/23 10:50

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01-04 Batch: WG1849655-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.668
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	2.00	0.668
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.668
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.668
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	2.00	0.668
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	2.00	0.668
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	0.668
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.668
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	0.668
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	2.00	0.668
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.668
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.668
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	0.668
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.668
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.668
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.668
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	0.668
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	0.668
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.668
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.668
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	2.00	0.668
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.668

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2364675
Report Date: 11/10/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 136,533
Analytical Date: 11/09/23 14:22
Analyst: CAP

Extraction Method: EPA 533
Extraction Date: 11/08/23 10:50

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01-04 Batch: WG1849655-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	99		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	88		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	100		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	90		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	102		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	87		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	93		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	102		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	92		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	111		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	99		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	100		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	107		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	107		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	109		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	98		50-200

Lab Control Sample Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2364675
Report Date: 11/10/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 Batch: WG1849655-2								
Perfluorobutanoic Acid (PFBA)	103		-		50-150	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	96		-		50-150	-		30
Perfluoropentanoic Acid (PFPeA)	101		-		50-150	-		30
Perfluorobutanesulfonic Acid (PFBS)	101		-		50-150	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	92		-		50-150	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	85		-		50-150	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	96		-		50-150	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	117		-		50-150	-		30
Perfluorohexanoic Acid (PFHxA)	95		-		50-150	-		30
Perfluoropentanesulfonic Acid (PFPeS)	104		-		50-150	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	94		-		50-150	-		30
Perfluoroheptanoic Acid (PFHpA)	97		-		50-150	-		30
Perfluorohexanesulfonic Acid (PFHxS)	96		-		50-150	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	115		-		50-150	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	96		-		50-150	-		30
Perfluorooctanoic Acid (PFOA)	107		-		50-150	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	106		-		50-150	-		30
Perfluorononanoic Acid (PFNA)	127		-		50-150	-		30
Perfluorooctanesulfonic Acid (PFOS)	92		-		50-150	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	107		-		50-150	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	105		-		50-150	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD

Project Number: ENG23-0864

Lab Number: L2364675

Report Date: 11/10/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 Batch: WG1849655-2								
Perfluorodecanoic Acid (PFDA)	105		-		50-150	-		30
Perfluoroundecanoic Acid (PFUnA)	107		-		50-150	-		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	103		-		50-150	-		30
Perfluorododecanoic Acid (PFDoA)	109		-		50-150	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	95				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	83				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	90				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	84				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	101				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	92				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	89				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	107				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	92				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	88				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	102				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	100				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	104				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	105				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	91				50-200

Matrix Spike Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD

Project Number: ENG23-0864

Lab Number: L2364675

Report Date: 11/10/23

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 EPA 533 - Mansfield Lab	Associated sample(s): 01-04		QC Batch ID: WG1849655-3			QC Sample: L2364674-01			Client ID: MS Sample			
Perfluorobutanoic Acid (PFBA)	3.29	1.85	4.96	90		-	-		50-150	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	1.85	1.43J	77		-	-		50-150	-		30
Perfluoropentanoic Acid (PFPeA)	2.29	1.85	4.10	98		-	-		50-150	-		30
Perfluorobutanesulfonic Acid (PFBS)	1.81	1.64	3.60	109		-	-		50-150	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	1.85	1.71J	92		-	-		50-150	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	1.65	1.38J	84		-	-		50-150	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	1.85	1.72J	93		-	-		50-150	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	1.74	1.60J	92		-	-		50-150	-		30
Perfluorohexanoic Acid (PFHxA)	3.08	1.85	4.63	84		-	-		50-150	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	1.74	1.98	114		-	-		50-150	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	1.85	2.18	118		-	-		50-150	-		30
Perfluoroheptanoic Acid (PFHpA)	2.31	1.85	4.40	113		-	-		50-150	-		30
Perfluorohexanesulfonic Acid (PFHxS)	0.888J	1.69	2.52	149		-	-		50-150	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	1.75	1.51J	86		-	-		50-150	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	0.870J	1.76	2.74	**155**	Q	-	-		50-150	-		30
Perfluorooctanoic Acid (PFOA)	21.4	1.85	22.8	76		-	-		50-150	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	1.77	1.78J	101		-	-		50-150	-		30
Perfluorononanoic Acid (PFNA)	ND	1.85	2.58	139		-	-		50-150	-		30
Perfluorooctanesulfonic Acid (PFOS)	6.04	1.72	7.62	92		-	-		50-150	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	1.73	1.72J	99		-	-		50-150	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	1.78	1.84J	103		-	-		50-150	-		30
Perfluorodecanoic Acid (PFDA)	ND	1.85	1.90	103		-	-		50-150	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD

Project Number: ENG23-0864

Lab Number: L2364675

Report Date: 11/10/23

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 EPA 533 - Mansfield Lab	Associated sample(s): 01-04		QC Batch ID: WG1849655-3			QC Sample: L2364674-01			Client ID: MS Sample			
Perfluoroundecanoic Acid (PFUnA)	ND	1.85	2.11	114		-	-		50-150	-		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	1.75	1.54J	88		-	-		50-150	-		30
Perfluorododecanoic Acid (PFDoA)	ND	1.85	1.92	104		-	-		50-150	-		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)	118				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	117				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	109				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	80				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	91				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	91				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	94				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	88				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	96				50-200
Perfluoro[13C4]Butanoic Acid (MPFBA)	96				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	82				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	103				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	94				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	89				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	98				50-200

Lab Duplicate Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2364675
Report Date: 11/10/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1849655-4 QC Sample: L2364674-02 Client ID: DUP Sample						
Perfluorobutanoic Acid (PFBA)	ND	ND	ng/l	NC		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	ND	ng/l	NC		30
Perfluoropentanoic Acid (PFPeA)	ND	ND	ng/l	NC		30
Perfluorobutanesulfonic Acid (PFBS)	ND	ND	ng/l	NC		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	ND	ng/l	NC		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	ND	ng/l	NC		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/l	NC		30
Perfluorohexanoic Acid (PFHxA)	ND	ND	ng/l	NC		30
Perfluoropentanesulfonic Acid (PFPeS)	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
Perfluoroheptanoic Acid (PFHpA)	ND	ND	ng/l	NC		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	ND	ng/l	NC		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/l	NC		30
Perfluorooctanoic Acid (PFOA)	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)	ND	ND	ng/l	NC		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	ND	ng/l	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2364675
Report Date: 11/10/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1849655-4 QC Sample: L2364674-02 Client ID: DUP Sample						
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/l	NC		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/l	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/l	NC		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	ND	ng/l	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/l	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	65		**31**	Q	50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	61		**26**	Q	50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	107		101		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	114		93		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	67		**31**	Q	50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	72		**33**	Q	50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	108		95		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	72		**36**	Q	50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	107		105		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	84		**47**	Q	50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	108		103		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	86		65		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	123		100		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	87		69		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	90		80		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	60		**24**	Q	50-200

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2364675
Report Date: 11/10/23

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(*)
L2364675-01A	Plastic 250ml Ammonium Acetate preserved	A	NA		2.7	Y	Absent		A2-533(28)
L2364675-01B	Plastic 250ml Ammonium Acetate preserved	A	NA		2.7	Y	Absent		A2-533(28)
L2364675-02A	Plastic 250ml Ammonium Acetate preserved	A	NA		2.7	Y	Absent		A2-533(28)
L2364675-02B	Plastic 250ml Ammonium Acetate preserved	A	NA		2.7	Y	Absent		A2-533(28)
L2364675-03A	Plastic 250ml Ammonium Acetate preserved	A	NA		2.7	Y	Absent		A2-533(28)
L2364675-03B	Plastic 250ml Ammonium Acetate preserved	A	NA		2.7	Y	Absent		A2-533(28)
L2364675-04A	Plastic 250ml Ammonium Acetate preserved	A	NA		2.7	Y	Absent		A2-533(28)

*Values in parentheses indicate holding time in days

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2364675
Report Date: 11/10/23

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-Chloroeicosafluoro-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: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2364675
Report Date: 11/10/23

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:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2364675
Project Number:	ENG23-0864	**Report Date:**	11/10/23

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: DU Report with 'J' Qualifiers

Project Name:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2364675
Project Number:	ENG23-0864	**Report Date:**	11/10/23

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. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers

Project Name:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2364675
Project Number:	ENG23-0864	**Report Date:**	11/10/23

Data Qualifiers

Identified Compounds (TICs). For calculated parameters, this represents that one or more values used in the calculation were estimated.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

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.)

REFERENCES

136 Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). EPA Method 533, EPA Document 815-B-19-020, November 2019.

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 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 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 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, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
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, **LACHAT 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).
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.

Serial_No:11102313:15

L2364675 DJL 11/1/23

CHAIN OF CUSTODY

PAGE ____ OF ____

ALPHA ANALYTICAL

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

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

Date Rec'd in Lab: 10/31/23

ALPHA Job #: L2364675

Client Information

Client: Weston & Sampson
Address: 98 S. Main Street, Waterbury, VT
Phone: 8026134106
Fax:
Email: Rosberg.Lee@wseinc.com

☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: VTDEC-Quarry Hill Road
Project Location: Pownal, Vermont
Project #: EN623-0964
Project Manager: Lee Rosberg
ALPHA Quote #:

Turn-Around Time

☒ Standard ☐ RUSH (only confirmed if pre-approved)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☒ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #: EN623-0964

Regulatory Requirements/Report Limits

State /Fed Program	Criteria
VT	

Other Project Specific Requirements/Comments/Detection Limits:

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	ANALYSIS: EPA method 533	SAMPLE HANDLING	TOTAL # BOTTLES
64675 -01	581 Quarry Hill Road 231030	10/30	959	DW	SRH	X		
-02	581 Quarry Hill Road 231030_In	10/30	1003	DW	SRH	X		
-03	581 Quarry Hill Road 231030_mid	10/30	1013	DW	SRH	X		
-04	581 Quarry Hill Road 231030_out	10/30	1015	DW	SRH	X		
-02	871 [redacted] North Pownal Road 231030	10/30	926	DW	SRH	X		
-03	DUP 231030 - 1	10/30	—	DW	SRH	X		
-04	DUP 231030 - 2	10/30	—	DW	SRH	X		
-04	Field Blank	10/30	—	DW	SRH	X		

SAMPLE HANDLING
Filtration
☐ Done
☐ Not needed
☐ Lab to do
Preservation
☐ Lab to do
(Please specify below)

Sample Specific Comments

Container Type	
Preservative	

Relinquished By:	Date/Time	Received By:	Date/Time
Fedex	10/30 415	Fedex	
	10/31/23 1015		10/31/23 1015

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.

FORM NO: 01-01 (rev. 14-OCT-07)


ORIGIN ID:MVLA (802) 560-4111
SHIPPING MANAGER
PACK & SEND PLUS
38 N. MAIN ST
ON THE ROUNDABOUT
WATERBURY, VT 05676
UNITED STATES US
SHIP DATE: 30OCT23
ACTWGT: 32.25 LB
CAD: 254358558/WSXI3600
DIMS: 24x14x13 IN
BILL SENDER
TO SAMPLE RECEIVING
ALPHA ANALYTICAL INC.
320 FORBES BLVD
MANSFIELD MA 02048
(508) 898-9220
REF: ACCOUNTS PAYABLE
DEPT:
FedEx
Express
TRK# 0201 7857 2790 6533
TUE - 31 OCT 10:30A
PRIORITY OVERNIGHT
XP PYMA
AHS
02048
MA-US BOS

ANALYTICAL REPORT

Lab Number:	L2359339
Client:	Weston & Sampson 98 South Main Street Suite 2 Waterbury, VT 05676
ATTN:	Lee Rosberg
Phone:	(802) 613-4106
Project Name:	VTDEC-QUARRY HILL ROAD
Project Number:	ENG23-0864
Report Date:	11/30/23

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0825), DoD (L2474), FL (E87814), IL (200081), IN (C-MA-04), KY (KY98046), LA (85084), ME (MA00030), MD (350), MI (99110) , NJ (MA015), NY (11627), NC (685), OH (CL106), OR (MA-0262), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #525-23-107-88708), 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: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2359339-01	1187 NORTH POWNAL ROAD 231004	DW	POWNAL, VERMONT	10/04/23 11:25	10/06/23
L2359339-02	581 QUARRY HILL ROAD 231004	DW	POWNAL, VERMONT	10/04/23 15:27	10/06/23
L2359339-03	DUP_2	DW	POWNAL, VERMONT	10/04/23 00:00	10/06/23
L2359339-04	FIELD BLANK 2	DW	POWNAL, VERMONT	10/04/23 00:00	10/06/23
L2359339-05	TP1	SOIL	POWNAL, VERMONT	10/04/23 13:58	10/06/23
L2359339-06	TP2	SOIL	POWNAL, VERMONT	10/04/23 15:57	10/06/23
L2359339-07	TP3	SOIL	POWNAL, VERMONT	10/04/23 16:56	10/06/23
L2359339-08	TP_DUP	SOIL	POWNAL, VERMONT	10/04/23 00:00	10/06/23
L2359339-09	EB	DW	POWNAL, VERMONT	10/04/23 00:00	10/06/23

Project Name:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2359339
Project Number:	ENG23-0864	**Report Date:**	11/30/23

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:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2359339
Project Number:	ENG23-0864	**Report Date:**	11/30/23

Case Narrative (continued)

Report Submission
November 30, 2023: This final report includes the results of the SPLP PFAAs by Isotope Dilution analysis performed on L2359339-05, -06 and -07.
November 07, 2023: This preliminary report includes the results of the PFAAs by Isotope Dilution analysis performed on L2359339-05 through -08 and the PFAAs by EPA 533 analysis performed on L2359339-09.
October 13, 2023: This is a preliminary report.

All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Perfluorinated Alkyl Acids by Isotope Dilution
L2359339-07 and -08: 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.
L2359339-07, -08 and WG1838548-2: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.
L2359339-07: The Extracted Internal Standard recoveries are less than 5% for n-deuteriomethylperfluoro-1-octanesulfonamidoacetic acid (d3-nmefosaa) (2%); however, re-extraction at a lower volume confirmed the original results. The results of the original analysis are reported.
L2359339-07: The Extracted Internal Standard recoveries are less than 2% for n-deuterioethylperfluoro-1-octanesulfonamidoacetic acid (d5-netfosaa) (1%) in both the original and re-extraction with lesser volume. The associated target compounds are not reported due to the insufficient recovery.
L2359339-08: The Extracted Internal Standard recoveries are less than 5% for n-deuteriomethylperfluoro-1-octanesulfonamidoacetic acid (d3-nmefosaa) (2%)and n-deuterioethylperfluoro-1-octanesulfonamidoacetic acid (d5-netfosaa) (3%); however, re-extraction at a lower volume confirmed the original results. The results of the original analysis are reported.
The WG1838548-2 LCS recovery, associated with L2359339-05 through -08, is above the acceptance criteria

Project Name:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2359339
Project Number:	ENG23-0864	**Report Date:**	11/30/23

Case Narrative (continued)

for and perfluorononanesulfonic acid (pfns) (128%); however, the associated samples are non-detect to the RL for this target analyte. The results of the original analysis are reported.

Perfluorinated Alkyl Acids by EPA 533

L2359339-09RE: The sample was re-extracted within holding time due to QC failures in the original extraction. The results of the re-extraction are reported.

L2359339-09RE: The sample has elevated detection limits due to limited sample volume available for analysis.

SPLP Perfluorinated Alkyl Acids by Isotope Dilution

WG1843753-2/-3: An LCS/LCSD was performed in lieu of a Matrix Spike and Laboratory Duplicate due to insufficient sample volume available for analysis.

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:  Alycia Mogayzel

Title: Technical Director/Representative Date: 11/30/23

ORGANICS

SEMIVOLATILES

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-01
Client ID: 1187 NORTH POWNAL ROAD 231004
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 11:25
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 10/13/23 15:05
Analyst: LMV

Extraction Method: EPA 533
Extraction Date: 10/12/23 16:35

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.81	0.603	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.81	0.603	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.81	0.603	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.81	0.603	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.81	0.603	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.81	0.603	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.81	0.603	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.81	0.603	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.81	0.603	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.81	0.603	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.81	0.603	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.81	0.603	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.81	0.603	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.81	0.603	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.81	0.603	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.81	0.603	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.81	0.603	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.81	0.603	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.81	0.603	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.81	0.603	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.81	0.603	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.81	0.603	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.81	0.603	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.81	0.603	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.81	0.603	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-01 Date Collected: 10/04/23 11:25

Client ID: 1187 NORTH POWNAL ROAD 231004 Date Received: 10/06/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	109		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	106		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	111		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	110		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	95		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	101		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	104		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	105		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	104		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	101		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	108		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	101		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	104		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	98		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	90		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	89		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-02
Client ID: 581 QUARRY HILL ROAD 231004
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 15:27
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 10/13/23 13:02
Analyst: LMV

Extraction Method: EPA 533
Extraction Date: 10/12/23 16:35

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	2.71		ng/l	1.73	0.577	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.73	0.577	1
Perfluoropentanoic Acid (PFPeA)	1.89		ng/l	1.73	0.577	1
Perfluorobutanesulfonic Acid (PFBS)	1.86		ng/l	1.73	0.577	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.73	0.577	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.73	0.577	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.73	0.577	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.73	0.577	1
Perfluorohexanoic Acid (PFHxA)	2.37		ng/l	1.73	0.577	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.73	0.577	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.73	0.577	1
Perfluoroheptanoic Acid (PFHpA)	2.10		ng/l	1.73	0.577	1
Perfluorohexanesulfonic Acid (PFHxS)	0.991	J	ng/l	1.73	0.577	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.73	0.577	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.73	0.577	1
Perfluorooctanoic Acid (PFOA)	16.6		ng/l	1.73	0.577	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.73	0.577	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.73	0.577	1
Perfluorooctanesulfonic Acid (PFOS)	6.95		ng/l	1.73	0.577	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.73	0.577	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.73	0.577	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.73	0.577	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.73	0.577	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.73	0.577	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.73	0.577	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-02 Date Collected: 10/04/23 15:27

Client ID: 581 QUARRY HILL ROAD 231004 Date Received: 10/06/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	108		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	107		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	109		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	115		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	96		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	101		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	103		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	114		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	105		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	97		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	115		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	96		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	109		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	94		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	89		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	89		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-03
Client ID: DUP_2
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 00:00
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 10/13/23 15:14
Analyst: LMV

Extraction Method: EPA 533
Extraction Date: 10/12/23 16:35

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	2.65		ng/l	1.77	0.591	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.77	0.591	1
Perfluoropentanoic Acid (PFPeA)	1.83		ng/l	1.77	0.591	1
Perfluorobutanesulfonic Acid (PFBS)	1.92		ng/l	1.77	0.591	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.77	0.591	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.77	0.591	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.77	0.591	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.77	0.591	1
Perfluorohexanoic Acid (PFHxA)	2.28		ng/l	1.77	0.591	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.77	0.591	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.77	0.591	1
Perfluoroheptanoic Acid (PFHpA)	1.97		ng/l	1.77	0.591	1
Perfluorohexanesulfonic Acid (PFHxS)	1.05	J	ng/l	1.77	0.591	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.77	0.591	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.77	0.591	1
Perfluorooctanoic Acid (PFOA)	18.3		ng/l	1.77	0.591	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.77	0.591	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.77	0.591	1
Perfluorooctanesulfonic Acid (PFOS)	6.76		ng/l	1.77	0.591	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.77	0.591	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.77	0.591	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.77	0.591	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.77	0.591	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.77	0.591	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.77	0.591	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-03 Date Collected: 10/04/23 00:00

Client ID: DUP_2 Date Received: 10/06/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	106		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	102		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	99		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	108		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	102		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	110		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	102		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	107		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	99		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	113		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	98		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	104		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	93		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	109		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	94		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	94		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-04
Client ID: FIELD BLANK 2
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 00:00
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 10/13/23 15:22
Analyst: LMV

Extraction Method: EPA 533
Extraction Date: 10/12/23 16:35

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.87	0.624	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	1.87	0.624	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.87	0.624	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.87	0.624	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	1.87	0.624	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	1.87	0.624	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	1.87	0.624	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.87	0.624	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.87	0.624	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.87	0.624	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	1.87	0.624	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.87	0.624	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.87	0.624	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.87	0.624	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.87	0.624	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.87	0.624	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.87	0.624	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.87	0.624	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.87	0.624	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	1.87	0.624	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.87	0.624	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.87	0.624	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.87	0.624	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	1.87	0.624	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.87	0.624	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-04 Date Collected: 10/04/23 00:00

Client ID: FIELD BLANK 2 Date Received: 10/06/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	108		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	109		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	96		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	98		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	110		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	112		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	104		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	121		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	89		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	118		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	98		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	108		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	95		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	116		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	104		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	107		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-05
Client ID: TP1
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 13:58
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/22/23 04:39
Analyst: PS
Percent Solids: 81%
TCLP/SPLP Ext. Date: 10/11/23 17:50

Extraction Method: ALPHA 23528
Extraction Date: 10/24/23 18:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	1.08	J	ng/l	1.99	0.406	1
Perfluoropentanoic Acid (PFPeA)	1.08	J	ng/l	1.99	0.394	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.99	0.237	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.99	0.450	1
Perfluorohexanoic Acid (PFHxA)	0.991	J	ng/l	1.99	0.326	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.99	0.244	1
Perfluoroheptanoic Acid (PFHpA)	1.11	J	ng/l	1.99	0.224	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.99	0.374	1
Perfluorooctanoic Acid (PFOA)	5.22		ng/l	1.99	0.235	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.99	1.32	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.99	0.684	1
Perfluorononanoic Acid (PFNA)	0.868	J	ng/l	1.99	0.310	1
Perfluorooctanesulfonic Acid (PFOS)	2.87		ng/l	1.99	0.501	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.99	0.302	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.99	1.20	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.99	1.11	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.99	0.645	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.99	0.259	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.99	0.975	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.99	0.577	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.99	0.800	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.99	0.370	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.99	0.326	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.99	0.247	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-05 Date Collected: 10/04/23 13:58

Client ID: TP1 Date Received: 10/06/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	94		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	105		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	93		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	138		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	94		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	91		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	93		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	95		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	122		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	92		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	90		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	86		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	97		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)	89		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	16		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	87		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	83		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	83		22-136

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-05
Client ID: TP1
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 13:58
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 10/31/23 19:05
Analyst: PS
Percent Solids: 81%

Extraction Method: ALPHA 23528
Extraction Date: 10/11/23 20:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	0.063	J	ng/g	0.597	0.027	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.597	0.055	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.298	0.047	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.19	0.077	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.597	0.063	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.19	0.100	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.298	0.054	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.298	0.072	1
Perfluorooctanoic Acid (PFOA)	0.281	JF	ng/g	0.298	0.050	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.597	0.214	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.597	0.163	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.298	0.090	1
Perfluorooctanesulfonic Acid (PFOS)	0.439		ng/g	0.298	0.155	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.298	0.080	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.597	0.343	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/g	1.19	0.357	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.597	0.241	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.597	0.056	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.597	0.183	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.597	0.117	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.597	0.101	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.597	0.084	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.597	0.244	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.597	0.065	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-05 Date Collected: 10/04/23 13:58

Client ID: TP1 Date Received: 10/06/23

Sample Location: POWNAL, VERMONT 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)	84		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	94		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	80		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	68		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	81		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	83		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	82		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	88		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	82		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	90		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	82		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)	67		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)	88		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	36		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	66		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	86		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	92		24-159

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-06
Client ID: TP2
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 15:57
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/22/23 04:55
Analyst: PS
Percent Solids: 81%
TCLP/SPLP Ext. Date: 10/11/23 17:50

Extraction Method: ALPHA 23528
Extraction Date: 10/24/23 18:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	0.441	J	ng/l	1.97	0.402	1
Perfluoropentanoic Acid (PFPeA)	0.453	J	ng/l	1.97	0.390	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.97	0.234	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.97	0.445	1
Perfluorohexanoic Acid (PFHxA)	0.441	JF	ng/l	1.97	0.323	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.97	0.241	1
Perfluoroheptanoic Acid (PFHpA)	0.354	J	ng/l	1.97	0.222	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.97	0.370	1
Perfluorooctanoic Acid (PFOA)	2.24		ng/l	1.97	0.232	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.97	1.31	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.97	0.677	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.97	0.307	1
Perfluorooctanesulfonic Acid (PFOS)	2.06		ng/l	1.97	0.496	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.97	0.299	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.97	1.19	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.97	1.10	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.97	0.638	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.97	0.256	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.97	0.965	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.97	0.571	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.97	0.791	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.97	0.366	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.97	0.322	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.97	0.244	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-06 Date Collected: 10/04/23 15:57

Client ID: TP2 Date Received: 10/06/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	90		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	104		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	93		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	102		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	89		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	90		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	88		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	88		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	99		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	90		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	89		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	86		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)	75		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	91		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	18		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	81		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	85		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	81		22-136

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-06
Client ID: TP2
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 15:57
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 10/31/23 19:22
Analyst: PS
Percent Solids: 81%

Extraction Method: ALPHA 23528
Extraction Date: 10/11/23 20:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.575	0.026	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.575	0.053	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.287	0.045	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.15	0.074	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.575	0.060	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.15	0.096	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.287	0.052	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.287	0.070	1
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.287	0.048	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.575	0.206	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.575	0.157	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.287	0.086	1
Perfluorooctanesulfonic Acid (PFOS)	0.224	J	ng/g	0.287	0.149	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.287	0.077	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.575	0.330	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/g	1.15	0.344	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.575	0.232	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.575	0.054	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.575	0.176	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.575	0.113	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.575	0.097	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.575	0.081	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.575	0.235	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.575	0.062	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-06 Date Collected: 10/04/23 15:57

Client ID: TP2 Date Received: 10/06/23

Sample Location: POWNAL, VERMONT 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)	87		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	98		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)	68		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	82		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	84		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	86		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	92		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	92		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	87		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	88		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)	82		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	53		31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	94		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	73		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	63		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	92		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	93		24-159

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-07
Client ID: TP3
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 16:56
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/22/23 05:12
Analyst: PS
Percent Solids: 79%
TCLP/SPLP Ext. Date: 10/11/23 17:50

Extraction Method: ALPHA 23528
Extraction Date: 10/24/23 18:20

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	1.16	J	ng/l	1.94	0.397	1
Perfluoropentanoic Acid (PFPeA)	0.588	J	ng/l	1.94	0.385	1
Perfluorobutanesulfonic Acid (PFBS)	0.397	J	ng/l	1.94	0.232	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.94	0.440	1
Perfluorohexanoic Acid (PFHxA)	1.10	J	ng/l	1.94	0.319	1
Perfluoropentanesulfonic Acid (PFPeS)	0.374	J	ng/l	1.94	0.238	1
Perfluoroheptanoic Acid (PFHpA)	3.44		ng/l	1.94	0.219	1
Perfluorohexanesulfonic Acid (PFHxS)	1.17	J	ng/l	1.94	0.366	1
Perfluorooctanoic Acid (PFOA)	118		ng/l	1.94	0.230	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.94	1.30	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.94	0.669	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.94	0.303	1
Perfluorooctanesulfonic Acid (PFOS)	1.56	JF	ng/l	1.94	0.490	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.94	0.296	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.94	1.18	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.94	1.09	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.94	0.630	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.94	0.253	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.94	0.953	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.94	0.564	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.94	0.782	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.94	0.362	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.94	0.318	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.94	0.241	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-07 Date Collected: 10/04/23 16:56

Client ID: TP3 Date Received: 10/06/23

Sample Location: POWNAL, VERMONT Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor

SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	80		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	90		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	95		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	105		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	82		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	82		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	97		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	84		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	98		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	91		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	95		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	89		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	92		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	69		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	95		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	11		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	90		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	91		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	87		22-136

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-07
Client ID: TP3
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 16:56
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 10/31/23 19:52
Analyst: PS
Percent Solids: 79%

Extraction Method: ALPHA 23528
Extraction Date: 10/11/23 20:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	0.056	J	ng/g	0.579	0.026	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.579	0.053	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.290	0.045	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.16	0.075	1
Perfluorohexanoic Acid (PFHxA)	0.067	JF	ng/g	0.579	0.061	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.16	0.097	1
Perfluoroheptanoic Acid (PFHpA)	0.097	J	ng/g	0.290	0.052	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.290	0.070	1
Perfluorooctanoic Acid (PFOA)	2.80		ng/g	0.290	0.049	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.579	0.208	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.579	0.158	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.290	0.087	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/g	0.290	0.150	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.290	0.078	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.579	0.332	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/g	1.16	0.346	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.579	0.233	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.579	0.054	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.579	0.177	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.579	0.081	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.579	0.237	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.579	0.063	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-07 Date Collected: 10/04/23 16:56

Client ID: TP3 Date Received: 10/06/23

Sample Location: POWNAL, VERMONT 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)	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)	44		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)	**70**	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)	61		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	**68**	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	**68**	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)	73		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	**2**	Q	31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	66		61-155
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	**53**	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	63		24-159

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2359339
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-07
Client ID: TP3
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 16:56
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/06/23 12:54
Analyst: JW
Percent Solids: 79%

Extraction Method: ALPHA 23528
Extraction Date: 10/11/23 20:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.579	0.113	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	63		5-117

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-08
Client ID: TP_DUP
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 00:00
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 10/31/23 20:08
Analyst: PS
Percent Solids: 85%

Extraction Method: ALPHA 23528
Extraction Date: 10/11/23 20:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.525	0.024	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.525	0.048	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.262	0.041	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.05	0.068	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.525	0.055	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.05	0.088	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.262	0.047	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.262	0.064	1
Perfluorooctanoic Acid (PFOA)	0.884	F	ng/g	0.262	0.044	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.525	0.188	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.525	0.143	1
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.262	0.079	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/g	0.262	0.136	1
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.262	0.070	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.525	0.301	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/g	1.05	0.314	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.525	0.211	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.525	0.049	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.525	0.160	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/g	0.525	0.089	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.525	0.074	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.525	0.215	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.525	0.057	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-08 Date Collected: 10/04/23 00:00

Client ID: TP_DUP Date Received: 10/06/23

Sample Location: POWNAL, VERMONT 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)	**24**	Q	61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	**31**	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)	43		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	**30**	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[13C8]Octanoic Acid (M8PFOA)	**42**	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	60		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	**46**	Q	72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	**59**	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)	39		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	**2**	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)	**3**	Q	34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	**53**	Q	54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	59		24-159

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-08
Client ID: TP_DUP
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 00:00
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Soil
Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/06/23 13:01
Analyst: JW
Percent Solids: 85%

Extraction Method: ALPHA 23528
Extraction Date: 10/11/23 20:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.525	0.103	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	57		5-117

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-09 RE
Client ID: EB
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 00:00
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:
Matrix: Dw
Analytical Method: 136,533
Analytical Date: 10/17/23 04:50
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 10/16/23 07:40

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	3.78	1.26	1
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	3.78	1.26	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	3.78	1.26	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	3.78	1.26	1
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	3.78	1.26	1
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	3.78	1.26	1
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	3.78	1.26	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	3.78	1.26	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	3.78	1.26	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	3.78	1.26	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	3.78	1.26	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	3.78	1.26	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	3.78	1.26	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	3.78	1.26	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	2.80	J	ng/l	3.78	1.26	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	3.78	1.26	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	3.78	1.26	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	3.78	1.26	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	3.78	1.26	1
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	3.78	1.26	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	3.78	1.26	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	3.78	1.26	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	3.78	1.26	1
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	3.78	1.26	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	3.78	1.26	1

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-09 RE
Client ID: EB
Sample Location: POWNAL, VERMONT

Date Collected: 10/04/23 00:00
Date Received: 10/06/23
Field Prep: Not Specified

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab						

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	55		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	88		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	103		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	105		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	97		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	100		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	95		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	103		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	100		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	111		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	104		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	76		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	106		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	97		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	104		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	78		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 10/26/23 11:40
Analyst: PS

Extraction Method: ALPHA 23528
Extraction Date: 10/11/23 20:30

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05-08 Batch: WG1838548-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/g	0.500	0.023
Perfluoropentanoic Acid (PFPeA)	ND		ng/g	0.500	0.046
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/g	0.250	0.039
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/g	1.00	0.065
Perfluorohexanoic Acid (PFHxA)	ND		ng/g	0.500	0.053
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/g	1.00	0.084
Perfluoroheptanoic Acid (PFHpA)	ND		ng/g	0.250	0.045
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/g	0.250	0.061
Perfluorooctanoic Acid (PFOA)	ND		ng/g	0.250	0.042
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/g	0.500	0.180
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/g	0.500	0.136
Perfluorononanoic Acid (PFNA)	ND		ng/g	0.250	0.075
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/g	0.250	0.130
Perfluorodecanoic Acid (PFDA)	ND		ng/g	0.250	0.067
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/g	0.500	0.287
Perfluorononanesulfonic Acid (PFNS)	ND		ng/g	1.00	0.299
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/g	0.500	0.202
Perfluoroundecanoic Acid (PFUnA)	ND		ng/g	0.500	0.047
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/g	0.500	0.153
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	0.098
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	0.211	J	ng/g	0.500	0.085
Perfluorododecanoic Acid (PFDoA)	ND		ng/g	0.500	0.070
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/g	0.500	0.204
Perfluorotetradecanoic Acid (PFTA)	ND		ng/g	0.500	0.054

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 10/26/23 11:40
Analyst: PS

Extraction Method: ALPHA 23528
Extraction Date: 10/11/23 20:30

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05-08 Batch: WG1838548-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	88		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	98		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	97		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)	94		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	96		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	97		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)	94		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	92		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)	127		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)	89		61-155
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	46		5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	58		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	90		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	74		24-159

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2359339
Report Date: 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 10/30/23 19:15
Analyst: JPW

Extraction Method: ALPHA 23528
Extraction Date: 10/11/23 20:30

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 05-08 Batch: WG1838548-1					
Perfluorooctanesulfonamide (FOSA)	ND		ng/g	0.500	0.098

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	62		5-117

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 136,533
Analytical Date: 10/13/23 12:01
Analyst: LMV

Extraction Method: EPA 533
Extraction Date: 10/12/23 16:35

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01-04 Batch: WG1838966-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.668
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	2.00	0.668
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.668
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.668
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	2.00	0.668
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	2.00	0.668
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	0.668
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.668
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	0.668
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	2.00	0.668
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.668
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.668
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	0.668
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.668
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.668
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.668
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	0.668
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	0.668
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.668
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.668
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	2.00	0.668
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.668

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 136,533
Analytical Date: 10/13/23 12:01
Analyst: LMV

Extraction Method: EPA 533
Extraction Date: 10/12/23 16:35

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 01-04 Batch: WG1838966-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	111		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	119		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	100		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	107		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	121		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	119		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	98		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	118		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	93		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	122		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	98		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	112		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	89		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	108		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	98		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	108		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 136,533
Analytical Date: 10/17/23 02:30
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 10/16/23 07:40

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 09 Batch: WG1840063-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	0.668
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND		ng/l	2.00	0.668
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	0.668
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.668
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND		ng/l	2.00	0.668
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND		ng/l	2.00	0.668
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	0.668
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.668
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	0.668
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	2.00	0.668
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.668
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.668
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	0.668
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.668
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	0.668
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.668
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	0.668
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND		ng/l	2.00	0.668
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	0.668
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.668
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.668
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND		ng/l	2.00	0.668
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.668

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 136,533
Analytical Date: 10/17/23 02:30
Analyst: JPW

Extraction Method: EPA 533
Extraction Date: 10/16/23 07:40

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab for sample(s): 09 Batch: WG1840063-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	106		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	104		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	98		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	95		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	100		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	87		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	104		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	100		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	104		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	90		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	108		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	106		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	102		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	104		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	88		50-200

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/22/23 03:49
Analyst: PS
TCLP/SPLP Extraction Date: 10/11/23 17:50

Extraction Method: ALPHA 23528
Extraction Date: 10/24/23 18:20

SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 05-07
Batch: WG1843753-1

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.94	0.395
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.94	0.384
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.94	0.230
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.94	0.438
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.94	0.318
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.94	0.238
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.94	0.218
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.94	0.364
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.94	0.229
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	1.94	1.29
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.94	0.666
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.94	0.302
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.94	0.488
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.94	0.294
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.94	1.17
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.94	1.08
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.94	0.628
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.94	0.252
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.94	0.950
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.94	0.562
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.94	0.779
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.94	0.360
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.94	0.317
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.94	0.240

Project Name: VTDEC-QUARRY HILL ROAD **Lab Number:** L2359339

Project Number: ENG23-0864 **Report Date:** 11/30/23

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 11/22/23 03:49
Analyst: PS
TCLP/SPLP Extraction Date: 10/11/23 17:50

Extraction Method: ALPHA 23528
Extraction Date: 10/24/23 18:20

Parameter	Result	Qualifier	Units	RL	MDL
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab for sample(s): 05-07 Batch: WG1843753-1					

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	98		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	115		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	98		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)	95		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	96		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	97		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	95		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	96		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	92		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	96		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	97		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	95		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	106		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	107		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	27		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	106		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	99		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	92		22-136

Lab Control Sample Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-08 Batch: WG1838548-2								
Perfluorobutanoic Acid (PFBA)	108		-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	104		-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	108		-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	104		-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	107		-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	103		-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	104		-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	101		-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	105		-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	105		-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	130		-		70-132	-		30
Perfluorononanoic Acid (PFNA)	110		-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	124		-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	99		-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	119		-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	**128**	Q	-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	106		-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	103		-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	124		-		59-134	-		30
Perfluorooctanesulfonamide (FOSA)	88		-		67-137	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	88		-		61-139	-		30
Perfluorododecanoic Acid (PFDoA)	100		-		69-135	-		30

Lab Control Sample Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2359339
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-08 Batch: WG1838548-2								
Perfluorotridecanoic Acid (PFTrDA)	124		-		66-139	-		30
Perfluorotetradecanoic Acid (PFTA)	93		-		69-133	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	84				61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	94				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)	81				14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	91				66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	94				71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	88				78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	87				75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	90				20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	82				72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	**68**	Q			79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	81				75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	91				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
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	53				5-117
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	75				34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	75				54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	76				24-159

Lab Control Sample Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD

Project Number: ENG23-0864

Lab Number: L2359339

Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab	Associated sample(s): 05-08		Batch: WG1838548-2					
Perfluorooctanesulfonamide (FOSA)	88		-		67-137	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	69				5-117

Lab Control Sample Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 Batch: WG1838966-2								
Perfluorobutanoic Acid (PFBA)	95		-		70-130	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	95		-		70-130	-		30
Perfluoropentanoic Acid (PFPeA)	98		-		70-130	-		30
Perfluorobutanesulfonic Acid (PFBS)	100		-		70-130	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	93		-		70-130	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	100		-		70-130	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	120		-		70-130	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	99		-		70-130	-		30
Perfluorohexanoic Acid (PFHxA)	92		-		70-130	-		30
Perfluoropentanesulfonic Acid (PFPeS)	96		-		70-130	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	102		-		70-130	-		30
Perfluoroheptanoic Acid (PFHpA)	93		-		70-130	-		30
Perfluorohexanesulfonic Acid (PFHxS)	103		-		70-130	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	90		-		70-130	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	104		-		70-130	-		30
Perfluorooctanoic Acid (PFOA)	98		-		70-130	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	83		-		70-130	-		30
Perfluorononanoic Acid (PFNA)	88		-		70-130	-		30
Perfluorooctanesulfonic Acid (PFOS)	92		-		70-130	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	86		-		70-130	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	101		-		70-130	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD

Project Number: ENG23-0864

Lab Number: L2359339

Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 01-04 Batch: WG1838966-2								
Perfluorodecanoic Acid (PFDA)	90		-		70-130	-		30
Perfluoroundecanoic Acid (PFUnA)	92		-		70-130	-		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	80		-		70-130	-		30
Perfluorododecanoic Acid (PFDoA)	92		-		70-130	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	105				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	101				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	104				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	105				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	109				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	117				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	103				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	118				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	93				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	117				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	115				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	119				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	98				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	115				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	105				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	100				50-200

Lab Control Sample Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 09 Batch: WG1840063-2								
Perfluorobutanoic Acid (PFBA)	94		-		70-130	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	96		-		70-130	-		30
Perfluoropentanoic Acid (PFPeA)	95		-		70-130	-		30
Perfluorobutanesulfonic Acid (PFBS)	93		-		70-130	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	88		-		70-130	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	89		-		70-130	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	118		-		70-130	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	103		-		70-130	-		30
Perfluorohexanoic Acid (PFHxA)	98		-		70-130	-		30
Perfluoropentanesulfonic Acid (PFPeS)	88		-		70-130	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	96		-		70-130	-		30
Perfluoroheptanoic Acid (PFHpA)	100		-		70-130	-		30
Perfluorohexanesulfonic Acid (PFHxS)	100		-		70-130	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	82		-		70-130	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	91		-		70-130	-		30
Perfluorooctanoic Acid (PFOA)	97		-		70-130	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	96		-		70-130	-		30
Perfluorononanoic Acid (PFNA)	90		-		70-130	-		30
Perfluorooctanesulfonic Acid (PFOS)	90		-		70-130	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	85		-		70-130	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	100		-		70-130	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD

Project Number: ENG23-0864

Lab Number: L2359339

Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 09 Batch: WG1840063-2								
Perfluorodecanoic Acid (PFDA)	88		-		70-130	-		30
Perfluoroundecanoic Acid (PFUnA)	99		-		70-130	-		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	78		-		70-130	-		30
Perfluorododecanoic Acid (PFDoA)	90		-		70-130	-		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	102				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	99				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	103				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	102				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	100				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	107				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	104				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	115				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	106				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	115				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	111				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	121				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	117				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	117				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	115				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	103				50-200

Lab Control Sample Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab Associated sample(s): 05-07 Batch: WG1843753-2 WG1843753-3								
Perfluorobutanoic Acid (PFBA)	92		94		67-148	2		30
Perfluoropentanoic Acid (PFPeA)	92		95		63-161	3		30
Perfluorobutanesulfonic Acid (PFBS)	92		95		65-157	3		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	92		94		37-219	2		30
Perfluorohexanoic Acid (PFHxA)	93		96		69-168	3		30
Perfluoropentanesulfonic Acid (PFPeS)	84		85		52-156	1		30
Perfluoroheptanoic Acid (PFHpA)	91		95		58-159	4		30
Perfluorohexanesulfonic Acid (PFHxS)	86		88		69-177	2		30
Perfluorooctanoic Acid (PFOA)	92		97		63-159	5		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	97		100		49-187	3		30
Perfluoroheptanesulfonic Acid (PFHpS)	90		94		61-179	4		30
Perfluorononanoic Acid (PFNA)	93		98		68-171	5		30
Perfluorooctanesulfonic Acid (PFOS)	84		86		52-151	2		30
Perfluorodecanoic Acid (PFDA)	96		94		63-171	2		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	80		100		56-173	22		30
Perfluorononanesulfonic Acid (PFNS)	80		91		48-150	13		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	96		93		60-166	3		30
Perfluoroundecanoic Acid (PFUnA)	98		96		60-153	2		30
Perfluorodecanesulfonic Acid (PFDS)	84		85		38-156	1		30
Perfluorooctanesulfonamide (FOSA)	90		89		46-170	1		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	100		94		45-170	6		30
Perfluorododecanoic Acid (PFDoA)	86		91		67-153	6		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD

Project Number: ENG23-0864

Lab Number: L2359339

Report Date: 11/30/23

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
SPLP Perfluorinated Alkyl Acids by Isotope Dilution & EPA 1312 - Mansfield Lab Associated sample(s): 05-07 Batch: WG1843753-2 WG1843753-3								
Perfluorotridecanoic Acid (PFTrDA)	97		96		48-158	1		30
Perfluorotetradecanoic Acid (PFTA)	91		94		59-182	3		30

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	99		101		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	113		118		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	99		102		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	104		108		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	99		99		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	98		97		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	100		105		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	100		96		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	99		107		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	100		94		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	101		106		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	93		98		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	117		96		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	91		101		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	97		107		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	53		57		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	95		108		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	95		103		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	95		98		22-136

Matrix Spike Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD

Project Number: ENG23-0864

Lab Number: L2359339

Report Date: 11/30/23

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): 05-08 QC Batch ID: WG1838548-3 QC Sample: L2358928-21 Client ID: MS Sample												
Perfluorobutanoic Acid (PFBA)	0.196J	5.98	6.92	112		-	-		71-135	-		30
Perfluoropentanoic Acid (PFPeA)	0.225J	5.98	6.81	110		-	-		69-132	-		30
Perfluorobutanesulfonic Acid (PFBS)	ND	5.31	6.10	115		-	-		72-128	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	5.61	6.29	112		-	-		62-145	-		30
Perfluorohexanoic Acid (PFHxA)	0.240J	5.98	6.97	112		-	-		70-132	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	5.64	6.35	113		-	-		73-123	-		30
Perfluoroheptanoic Acid (PFHpA)	0.318	5.98	7.05	113		-	-		71-131	-		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	5.47	5.97	109		-	-		67-130	-		30
Perfluorooctanoic Acid (PFOA)	4.49	5.98	11.8	122		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	5.7	5.89	103		-	-		64-140	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	0.536J	5.71	13.5	**227**	Q	-	-		70-132	-		30
Perfluorononanoic Acid (PFNA)	1.51	5.98	8.80	122		-	-		72-129	-		30
Perfluorooctanesulfonic Acid (PFOS)	490E	5.55	576E	**1550**	Q	-	-		68-136	-		30
Perfluorodecanoic Acid (PFDA)	6.66	5.98	13.7	118		-	-		69-133	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	5.74	8.33	**145**	Q	-	-		65-137	-		30
Perfluorononanesulfonic Acid (PFNS)	ND	5.76	12.7	**221**	Q	-	-		69-125	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	5.98	7.90	132		-	-		63-144	-		30
Perfluoroundecanoic Acid (PFUnA)	8.50	5.98	14.5	100		-	-		64-136	-		30
Perfluorodecanesulfonic Acid (PFDS)	ND	5.78	11.4	**197**	Q	-	-		59-134	-		30
Perfluorododecanoic Acid (PFDoA)	2.49	5.98	8.24	96		-	-		69-135	-		30
Perfluorotridecanoic Acid (PFTrDA)	1.49	5.98	8.51	117		-	-		66-139	-		30
Perfluorotetradecanoic Acid (PFTA)	0.280JF	5.98	7.02	113		-	-		69-133	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

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): 05-08 QC Batch ID: WG1838548-3 QC Sample: L2358928-21 Client ID: MS Sample												
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	58.3	73.2	125		-	-		41-165	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	5.66	7.20	127		-	-		61-135	-		30
Perfluorohexadecanoic Acid (PFHxDA)	ND	5.98	6.31	105		-	-		18-191	-		30
Perfluorooctadecanoic Acid (PFODA)	ND	5.98	3.07	51		-	-		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)	125				19-175
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	130				14-167
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	148				20-154
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	82				10-203
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	40				31-134
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	79				61-155
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	**72**	Q			75-130
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	85				66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	87				71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	**146**	Q			78-139
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	79				54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	79				24-159
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	115				10-145
Perfluoro[13C4]Butanoic Acid (MPFBA)	74				61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	84				58-150
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	**74**	Q			79-136
Perfluoro[13C8]Octanoic Acid (M8PFOA)	**74**	Q			75-130

Matrix Spike Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD

Project Number: ENG23-0864

Lab Number: L2359339

Report Date: 11/30/23

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): 05-08 QC Batch ID: WG1838548-3 QC Sample: L2358928-21 Client ID: MS Sample												

Surrogate (Extracted Internal Standard)	*MS % Recovery*	*MS Qualifier*	*MSD % Recovery*	*MSD Qualifier*	*Acceptance Criteria*
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	**70**	Q			72-140
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	**145**	Q			74-139

Matrix Spike Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2359339
Report Date: 11/30/23

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 EPA 533 - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1838966-3 WG1838966-4 QC Sample: L2358073-01 Client ID: MS Sample												
Perfluorobutanoic Acid (PFBA)	ND	146	141	97		139	94		70-130	1		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	146	130	89		126	85		70-130	3		30
Perfluoropentanoic Acid (PFPeA)	ND	146	139	95		140	95		70-130	1		30
Perfluorobutanesulfonic Acid (PFBS)	0.667J	130	135	104		123	94		70-130	9		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	146	138	94		139	94		70-130	1		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	130	133	102		120	91		70-130	10		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	146	173	119		175	118		70-130	1		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	137	130	95		123	89		70-130	6		30
Perfluorohexanoic Acid (PFHxA)	ND	146	143	98		142	96		70-130	1		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	137	137	100		129	93		70-130	6		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	146	145	99		141	95		70-130	3		30
Perfluoroheptanoic Acid (PFHpA)	ND	146	133	91		143	97		70-130	7		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	133	140	105		135	100		70-130	4		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	138	132	96		128	92		70-130	3		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	139	132	95		127	90		70-130	4		30
Perfluorooctanoic Acid (PFOA)	ND	146	148	101		131	89		70-130	12		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	139	126	90		129	92		70-130	2		30
Perfluorononanoic Acid (PFNA)	ND	146	139	95		119	81		70-130	16		30
Perfluorooctanesulfonic Acid (PFOS)	ND	135	121	89		126	92		70-130	4		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	136	115	84		125	91		70-130	8		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	140	141	101		151	106		70-130	7		30

Matrix Spike Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

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 EPA 533 - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1838966-3 WG1838966-4 QC Sample: L2358073-01 Client ID: MS Sample												
Perfluorodecanoic Acid (PFDA)	ND	146	136	93		139	94		70-130	2		30
Perfluoroundecanoic Acid (PFUnA)	ND	146	139	95		142	96		70-130	2		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	138	117	85		114	82		70-130	3		30
Perfluorododecanoic Acid (PFDoA)	ND	146	142	97		140	95		70-130	1		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)	96		99		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	106		115		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	101		104		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	97		95		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	102		100		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	102		98		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	105		101		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	116		102		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	100		110		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	90		96		50-200
Perfluoro[13C4]Butanoic Acid (MPFBA)	104		103		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	101		98		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	107		115		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	105		105		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	104		118		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	96		108		50-200

Matrix Spike Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2359339
Report Date: 11/30/23

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 EPA 533 - Mansfield Lab	Associated sample(s): 09	QC Batch ID: WG1840063-3	QC Sample: L2358983-01	Client ID: MS Sample								
Perfluorobutanoic Acid (PFBA)	2.09	36.4	35.0	90		-	-		70-130	-		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	36.4	26.8	74		-	-		70-130	-		30
Perfluoropentanoic Acid (PFPeA)	1.66J	36.4	35.8	98		-	-		70-130	-		30
Perfluorobutanesulfonic Acid (PFBS)	0.793J	32.3	29.1	90		-	-		70-130	-		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	36.4	33.3	92		-	-		70-130	-		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	32.4	28.2	87		-	-		70-130	-		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	36.4	35.7	98		-	-		70-130	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	34.1	32.9	96		-	-		70-130	-		30
Perfluorohexanoic Acid (PFHxA)	1.61J	36.4	34.7	95		-	-		70-130	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	34.2	30.6	90		-	-		70-130	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND	36.4	33.2	91		-	-		70-130	-		30
Perfluoroheptanoic Acid (PFHpA)	0.729J	36.4	35.9	99		-	-		70-130	-		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	33.2	31.4	95		-	-		70-130	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	34.3	29.2	85		-	-		70-130	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	34.6	33.1	96		-	-		70-130	-		30
Perfluorooctanoic Acid (PFOA)	2.01	36.4	35.4	92		-	-		70-130	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	34.7	29.9	86		-	-		70-130	-		30
Perfluorononanoic Acid (PFNA)	ND	36.4	34.0	94		-	-		70-130	-		30
Perfluorooctanesulfonic Acid (PFOS)	ND	33.8	30.8	91		-	-		70-130	-		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	34	32.2	95		-	-		70-130	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	34.9	38.2	109		-	-		70-130	-		30
Perfluorodecanoic Acid (PFDA)	ND	36.4	33.4	92		-	-		70-130	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

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 EPA 533 - Mansfield Lab	Associated sample(s): 09	QC Batch ID: WG1840063-3	QC Sample: L2358983-01	Client ID: MS Sample								
Perfluoroundecanoic Acid (PFUnA)	ND	36.4	32.7	90		-	-		70-130	-		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	34.3	27.2	79		-	-		70-130	-		30
Perfluorododecanoic Acid (PFDoA)	ND	36.4	33.1	91		-	-		70-130	-		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)	125				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	128				50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	114				50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	89				50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	121				50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	113				50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	102				50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	102				50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	104				50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	115				50-200
Perfluoro[13C4]Butanoic Acid (MPFBA)	97				50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	91				50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	112				50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	108				50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	112				50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	104				50-200

Lab Duplicate Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-08 QC Batch ID: WG1838548-4 QC Sample: L2358928-22 Client ID: DUP Sample						
Perfluorobutanoic Acid (PFBA)	0.287J	0.321J	ng/g	NC		30
Perfluoropentanoic Acid (PFPeA)	0.390J	0.401J	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)	0.555J	0.551J	ng/g	NC		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	ND	ng/g	NC		30
Perfluoroheptanoic Acid (PFHpA)	1.02	1.11	ng/g	8		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	ND	ng/g	NC		30
Perfluorooctanoic Acid (PFOA)	5.27	4.85	ng/g	8		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/g	NC		30
Perfluoroheptanesulfonic Acid (PFHpS)	0.330J	0.366J	ng/g	NC		30
Perfluorononanoic Acid (PFNA)	3.02	3.10	ng/g	3		30
Perfluorooctanesulfonic Acid (PFOS)	256E	266E	ng/g	4		30
Perfluorodecanoic Acid (PFDA)	17.2	20.0	ng/g	15		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	0.504J	0.784F	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)	23.5	23.5	ng/g	0		30
Perfluorodecanesulfonic Acid (PFDS)	0.242J	ND	ng/g	NC		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	55.6	62.9	ng/g	12		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-08 QC Batch ID: WG1838548-4 QC Sample: L2358928-22 Client ID: DUP Sample						
Perfluorododecanoic Acid (PFDoA)	4.96	5.30	ng/g	7		30
Perfluorotridecanoic Acid (PFTrDA)	1.04	1.27	ng/g	20		30
Perfluorotetradecanoic Acid (PFTA)	0.508J	0.607JF	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)	0.152J	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)	72		71		61-135
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	83		82		58-150
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	104		112		74-139
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	99		107		14-167
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	80		85		66-128
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	81		88		71-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	107		112		78-139
Perfluoro[13C8]Octanoic Acid (M8PFOA)	**71**	Q	85		75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	108		114		20-154
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	72		82		72-140
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	**73**	Q	**76**	Q	79-136
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	**74**	Q	**74**	Q	75-130
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	69		95		19-175
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	45		46		31-134

Lab Duplicate Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits

Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 05-08 QC Batch ID: WG1838548-4 QC Sample: L2358928-22 Client ID: DUP Sample

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	73		77		61-155
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	60		62		34-137
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	78		73		54-150
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	71		75		24-159
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	80		83		10-203
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	108		112		10-145

Lab Duplicate Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 09 QC Batch ID: WG1840063-4 QC Sample: L2358983-02 Client ID: DUP Sample						
Perfluorobutanoic Acid (PFBA)	1.82J	1.90J	ng/l	NC		30
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	ND	ND	ng/l	NC		30
Perfluoropentanoic Acid (PFPeA)	1.09J	1.15J	ng/l	NC		30
Perfluorobutanesulfonic Acid (PFBS)	ND	ND	ng/l	NC		30
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	ND	ND	ng/l	NC		30
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	ND	ND	ng/l	NC		30
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/l	NC		30
Perfluorohexanoic Acid (PFHxA)	0.794J	0.774J	ng/l	NC		30
Perfluoropentanesulfonic Acid (PFPeS)	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
Perfluoroheptanoic Acid (PFHpA)	ND	ND	ng/l	NC		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	ND	ng/l	NC		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/l	NC		30
Perfluorooctanoic Acid (PFOA)	1.05J	1.01J	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)	ND	ND	ng/l	NC		30
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid (9Cl-PF3ONS)	ND	ND	ng/l	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 533 - Mansfield Lab Associated sample(s): 09 QC Batch ID: WG1840063-4 QC Sample: L2358983-02 Client ID: DUP Sample						
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/l	NC		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/l	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/l	NC		30
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	ND	ND	ng/l	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/l	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	100		94		50-200
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	98		89		50-200
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	94		96		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	109		109		50-200
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	100		100		50-200
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	110		93		50-200
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	97		96		50-200
Perfluoro[13C8]Octanoic Acid (M8PFOA)	101		104		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	111		97		50-200
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	110		107		50-200
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	104		104		50-200
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	109		114		50-200
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	120		118		50-200
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	112		115		50-200
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	108		115		50-200
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	85		83		50-200

INORGANICS
&
MISCELLANEOUS

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2359339
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-05
Client ID: TP1
Sample Location: POWNAL, VERMONT
Sample Depth:
Matrix: Soil

Date Collected: 10/04/23 13:58
Date Received: 10/06/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	81.1		%	0.100	0.100	1	-	10/12/23 09:41	121,2540G	BLR

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2359339
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-06
Client ID: TP2
Sample Location: POWNAL, VERMONT
Sample Depth:
Matrix: Soil

Date Collected: 10/04/23 15:57
Date Received: 10/06/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	81.1		%	0.100	0.100	1	-	10/12/23 09:41	121,2540G	BLR

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2359339
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-07
Client ID: TP3
Sample Location: POWNAL, VERMONT
Sample Depth:
Matrix: Soil

Date Collected: 10/04/23 16:56
Date Received: 10/06/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	79.4		%	0.100	0.100	1	-	10/12/23 09:41	121,2540G	BLR

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2359339
Report Date: 11/30/23

SAMPLE RESULTS

Lab ID: L2359339-08
Client ID: TP_DUP
Sample Location: POWNAL, VERMONT
Sample Depth:
Matrix: Soil

Date Collected: 10/04/23 00:00
Date Received: 10/06/23
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Mansfield Lab										
Solids, Total	84.7		%	0.100	0.100	1	-	10/12/23 09:41	121,2540G	BLR

Lab Duplicate Analysis

Batch Quality Control

Project Name: VTDEC-QUARRY HILL ROAD

Project Number: ENG23-0864

Lab Number: L2359339

Report Date: 11/30/23

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Mansfield Lab Associated sample(s): 05-08 QC Batch ID: WG1838076-1 QC Sample: L2358627-05 Client ID: DUP Sample						
Solids, Total	87.4	87.6	%	0		10

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

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(*)
L2359339-01A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.8	Y	Absent		A2-533(28)
L2359339-01B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.8	Y	Absent		A2-533(28)
L2359339-02A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.8	Y	Absent		A2-533(28)
L2359339-02B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.8	Y	Absent		A2-533(28)
L2359339-03A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.8	Y	Absent		A2-533(28)
L2359339-03B	Plastic 250ml Ammonium Acetate preserved	A	NA		3.8	Y	Absent		A2-533(28)
L2359339-04A	Plastic 250ml Ammonium Acetate preserved	A	NA		3.8	Y	Absent		A2-533(28)
L2359339-05A	Plastic 8oz unpreserved	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(90)
L2359339-05B	Plastic 2oz unpreserved for TS	A	NA		3.8	Y	Absent		A2-TS(7)
L2359339-05C	Plastic 8oz unpreserved	A	NA		3.8	Y	Absent		-
L2359339-05D	Plastic 2oz unpreserved for TS	A	NA		3.8	Y	Absent		A2-TS(7)
L2359339-05X	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)
L2359339-05X1	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)
L2359339-05X2	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)
L2359339-05X3	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)
L2359339-05X9	Tumble Vessel	A	NA		3.8	Y	Absent		-
L2359339-06A	Plastic 8oz unpreserved	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(90)
L2359339-06B	Plastic 2oz unpreserved for TS	A	NA		3.8	Y	Absent		A2-TS(7)
L2359339-06C	Plastic 8oz unpreserved	A	NA		3.8	Y	Absent		-
L2359339-06D	Plastic 2oz unpreserved for TS	A	NA		3.8	Y	Absent		A2-TS(7)
L2359339-06X	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)
L2359339-06X1	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)
L2359339-06X2	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)

*Values in parentheses indicate holding time in days

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2359339-06X3	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)
L2359339-06X9	Tumble Vessel	A	NA		3.8	Y	Absent		-
L2359339-07A	Plastic 8oz unpreserved	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(90)
L2359339-07B	Plastic 2oz unpreserved for TS	A	NA		3.8	Y	Absent		A2-TS(7)
L2359339-07C	Plastic 8oz unpreserved	A	NA		3.8	Y	Absent		-
L2359339-07D	Plastic 2oz unpreserved for TS	A	NA		3.8	Y	Absent		A2-TS(7)
L2359339-07X	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)
L2359339-07X1	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)
L2359339-07X2	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)
L2359339-07X3	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-537-ISOTOPE(14)
L2359339-07X9	Tumble Vessel	A	NA		3.8	Y	Absent		-
L2359339-08A	Plastic 8oz unpreserved	A	NA		3.8	Y	Absent		A2-537-ISOTOPE(90)
L2359339-08B	Plastic 2oz unpreserved for TS	A	NA		3.8	Y	Absent		A2-TS(7)
L2359339-08C	Plastic 8oz unpreserved	A	NA		3.8	Y	Absent		-
L2359339-08D	Plastic 2oz unpreserved for TS	A	NA		3.8	Y	Absent		A2-TS(7)
L2359339-08X	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-EXT-ISOTOPE(28)
L2359339-08X1	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-EXT-ISOTOPE(28)
L2359339-08X2	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-EXT-ISOTOPE(28)
L2359339-08X3	Plastic 250ml unpreserved Extracts	A	NA		3.8	Y	Absent		A2-SPLP-EXT-ISOTOPE(28)
L2359339-08X9	Tumble Vessel	A	NA		3.8	Y	Absent		-
L2359339-09A	Plastic 120ml unpreserved	A	NA		3.8	N	Absent		A2-533(28)
L2359339-09B	Plastic 120ml unpreserved	A	NA		3.8	N	Absent		A2-533(28)

*Values in parentheses indicate holding time in days

Project Name: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864
Lab Number: L2359339
Report Date: 11/30/23

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-Chloroeicosafluoro-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: VTDEC-QUARRY HILL ROAD
Project Number: ENG23-0864

Lab Number: L2359339
Report Date: 11/30/23

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:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2359339
Project Number:	ENG23-0864	**Report Date:**	11/30/23

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: DU Report with 'J' Qualifiers

Project Name:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2359339
Project Number:	ENG23-0864	**Report Date:**	11/30/23

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. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively

Report Format: DU Report with 'J' Qualifiers

Project Name:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2359339
Project Number:	ENG23-0864	**Report Date:**	11/30/23

Data Qualifiers

Identified Compounds (TICs). For calculated parameters, this represents that one or more values used in the calculation were estimated.

M - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.

ND - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.

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:	VTDEC-QUARRY HILL ROAD	**Lab Number:**	L2359339
Project Number:	ENG23-0864	**Report Date:**	11/30/23

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.

136 Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). EPA Method 533, EPA Document 815-B-19-020, November 2019.

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 624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625.1: alpha-Terpineol
EPA 8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 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 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, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
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, **LACHAT 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).
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 _____ OF _____

ALPHA ANALYTICAL
WESTBORO, MA TEL: 508-898-9220 FAX: 508-898-9193
MANSFIELD, MA TEL: 508-822-9300 FAX: 508-822-3288

Date Rec'd in Lab: 10/6/23

ALPHA Job #: L2359339

Client Information

Client: Weston & Sampson
Address: 98 S. Main St, Waterbury, VT
Phone: 8026134106
Fax:
Email: Rosberg.Lee@wseinc.com
☐ These samples have been previously analyzed by Alpha

Project Information

Project Name: VTDEC-Quarry Hill Road
Project Location: Pownal, Vermont
Project #: ENG23-0864
Project Manager: Lee Rosberg
ALPHA Quote #:

Turn-Around Time

☑ Standard ☐ RUSH (only confirmed if pre-approved!)
Date Due: Time:

Report Information - Data Deliverables

☐ FAX ☑ EMAIL
☐ ADEx ☐ Add'l Deliverables

Billing Information

☐ Same as Client info PO #: ENG23-0864

Regulatory Requirements/Report Limits

State /Fed Program	Criteria
VT	

Other Project Specific Requirements/Comments/Detection Limits:

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler's Initials	EPA Method 533	EPA Method 537 as analysis by isotope dilution	SPLP-Archive	Sample Specific Comments	TOTAL # BOTTLES
9359-01	1187 North Pownal Road 231004	10/4	11:25	DW	SRH	X				
-02	581 Quarry Hill Road 231004	10/4	1527	DW	SRH	X				
-03	DUP_2	10/4	—	DW	SRH	X				
-04	Field Blank 2	10/4	—	DW	SRH	X				
-05	TP1	10/4	1358	S	SRH		X	X		
-06	TP2	10/4	1557	S	SRH		X	X		
-07	TP3	10/4	1656	S	SRH		X	X		
-08	TP_DUP	10/4	—	S	SRH		X	X		
-09	EB	10/4	—	DW	SRH	X				

SAMPLE HANDLING

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

Container Type	P	P	P
Preservative	AA		

Relinquished By:	Date/Time	Received By:	Date/Time
Daelyn Haley FEDEX	10/5 954	FEDEX	
	10/6DS 959		10/6/23 959

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.

FORM NO: 01-01 (rev. 14-OCT-07)

APPENDIX E

WELL COMPLETION/HYDROFRACTURING/CLOSURE REPORT

STATE OF VERMONT – DEPT. OF ENVIRONMENTAL CONSERVATION

Drinking Water & Groundwater Protection Division (DWGWPD),
1 National Life Drive, Main 2, Montpelier, VT 05620-3521
Tel. (802) 828-1535 or (802) 585-4907

WELL LOCATION

Well Owner or Purchaser: Brian O'Neil
E-911 Address of Well: 583 Quarry Hill Rd
Town: Fowral
Subdivision Name: _____
Lot Number: _____

WELL TAG No. 63504
Date Drilling or Hydrofracturing Was Completed: 8 / 24 / 22
Wastewater/Water Permit #: WW-8-0814-1
Parcel SPAN Number: _____

GEOGRAPHIC LOCATION

GPS Location: 42°48'06.4" N, - 073°15'06.1" W
(Latitude in decimal degrees) (Longitude in decimal degrees)

WELL TYPE (Check one)
- ☒ Bedrock well (well finishes in bedrock)
- ☐ Gravel well (well is NOT into bedrock)

WELL USE (Check one)
- ☒ Residential/Non-public
- ☐ Public water system
- ☐ Agricultural
- ☐ Industrial
- ☐ Commercial
- ☐ Monitoring well

REASON FOR WELL (Check one)
- ☒ New supply
- ☐ Replace existing supply ---> Exempt from permit? ☐ Yes ☐ No
- ☐ Deepen/Hydrofracture existing supply
- ☐ Test/Exploration/Monitoring
- ☐ Geothermal

☐ **WELL CLOSURE** Date the well was closed: ____/____/____
Closed per the Water Supply Rule? ☐ Yes ☐ NO Grout/fill type: _____
Reason for closure: ☐ Insufficient yield ☐ Contaminated ☐ Disrepair ☐ No longer in use ☐ Test well
☐ Poor aesthetic quality ☐ Does not meet isolation distances ☐ Pump stuck ☐ Collapsed ☐ Other _____
Please use the WELL LOG section below to list the depth and materials used at each depth in filling the well.

WELL CONSTRUCTION INFORMATION

DEPTHS
To bedrock: 5 ft.
Total Depth: 600 ft.

CASING
Total Length: 20 ft.
Casing exposed: 18 in.
Diameter: 6 in.
Material: Steel
Weight: 17 lb/ft.

LINER OR INNER CASING
Total Length: _____ ft.
Depth to liner top: _____ ft.
Diameter: _____ in.
Material: _____
Weight: _____ lb/ft.
Seal type: _____

SCREEN DETAILS
Make/Type: _____
Material: _____
Diameter: _____ in.
Depth to screen top: _____
Slot size: _____
Gravel pack (type/size): _____

WELL LOG

From:	To:	Subsurface materials and water-bearing zones:
0	5	T- Till & Hard pan
5	20	R- White Limestone med.
20	600	R- Black & White limestone med.

SEALING METHOD
- ☒ Drive Shoe
- ☐ Grouted; type: _____
- ☐ Concentric

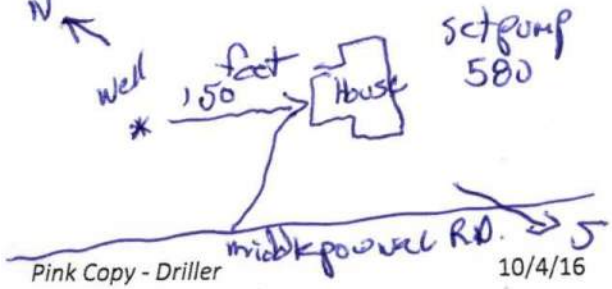
YIELD TEST
Tested for 1 hr. @ 1/2 GPM
Static Water Level: 300 ft.
Date Measured: 8-24-22
☐ Overflowing? (check if yes)
☐ Hydrofractured? _____ GPM

WELL DRILLER INFORMATION

☒ Yes ☐ No - *I provided the property owner with the Dept. of Health water testing information, per 10 V.S.A. Section 1396(d).*

Drilled by: Jody Townsend
Signature of Qualifying Individual
Company: frostwells & pumps
VT Well Driller License Number: 265

COMMENTS AND/OR SITE SKETCH



White Copy - DWGWPD *Yellow Copy - Owner* *Pink Copy - Driller*

10/4/16

APPENDIX F

Appendix F - Multi-Variate Plots