HALEY ALDRICH

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REPORT ON

MACHIAS LANDFILL INVESTIGATION
MACHIAS DIKE BRIDGE
MAINEDOT WIN 16714.00
MACHIAS, MAINE

by
Haley & Aldrich, Inc.
Portland, Maine

for
Maine Department of Transportation
Augusta, Maine

File No. 0130749-009
November 2022

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9 November 2022
File No. 0130749-009

Maine Department of Transportation
16 State House Station
Augusta, Maine 04333-0016

Attention: Dwight Doughty, Jr., C.G.

Subject: Report on Machias Landfill Investigation
Machias Dike Bridge
MaineDOT WIN 16714.00
Machias, Maine

Ladies and Gentlemen:

We are pleased to submit herewith our report entitled, "Report on Machias Landfill Investigation, Machias Dike Bridge, MaineDOT WIN 16714.00, Machias Maine." This report has been prepared in accordance with our mutually agreed upon work scope and in accordance with the scope outlined in our Assignment Letter #8, dated 14 June 2022, under our environmental MultiWIN contract number 20170626000000000824 dated 22 June 2017.

Introduction

This report presents the results of the subsurface investigation and laboratory testing programs, groundwater monitoring program, and geotechnical evaluations conducted by Haley & Aldrich, Inc. (Haley & Aldrich) on behalf of the Maine Department of Transportation (MaineDOT) for the proposed Machias Dike Bridge project at the Machias Landfill in Machias, Maine (see Figure 1, Project Locus).

HORIZONTAL COORDINATE SYSTEM AND ELEVATION DATUM

Plan locations of test borings are reported as northing and easting coordinates relative to the Maine State Plane Coordinate System, North American Datum of 1983 (NAD 83), Maine 2000 East Zone.

The project elevation datum and elevations referenced herein are in feet and reference the North American Vertical Datum of 1988 (NAVD 88).

PROJECT LOCATION AND EXISTING SITE CONDITIONS

The project site is located at an existing, grass-covered, closed landfill, with natural site grades around the landfill ranging from approximately El. 10 northeast of the landfill to approximately El. 55 southwest

of the landfill. The maximum ground surface elevation within the existing landfill footprint is at approximately El. 69. A two-lane road and residential homes are located to the south and west of the landfill. The area to the north and east of the landfill is generally undeveloped and occupied by wooded areas and grassed fields.

A series of timber box culverts are currently located below US Route 1 at the mouth of the Middle River. The culvert conveys water flow between the Machias and Middle Rivers during tide cycles, with a current inundation level of approximately El. -1.0.

PROPOSED IMPROVEMENTS

We understand that MaineDOT is currently considering replacing the existing culvert with a single-span bridge at the mouth of the Middle River. The bridge is proposed to have a larger hydraulic opening than the existing culvert and would result in higher water inundation levels on the upstream (west) side of the proposed replacement bridge. Inundation levels up to approximately El. 14.7 (including sea level rise) were used in the evaluations below. It is our understanding, based on discussions with MaineDOT, that this elevation is the highest water level between proposed "Alternative 10" and the "do nothing" condition. The larger water inundation area will extend up to the eastern edge of the existing landfill.

Subsurface Exploration Program

Haley & Aldrich completed an initial subsurface exploration program in association with the subject project consisting of five test borings designated HA22-1/HA22-1B, HA22-2, and HA22-5 through HA22-7, that were drilled at the site from 27 June to 1 July 2022. Test borings HA22-3 and HA22-4 were laid out in the field and planned to be drilled depending on conditions encountered and available time. These two borings were not drilled. The purpose of the subsurface exploration program was to characterize the general subsurface conditions in the area of the existing landfill that could be impacted by the larger inundation area.

Haley & Aldrich completed a supplemental subsurface exploration program consisting of three test borings designated HA22-8 through HA22-10, that were drilled at the site from 25 to 26 July 2022. The purpose of the supplemental program was to install additional wells to monitor groundwater levels and to collect groundwater samples for analytical testing.

The test boring locations were laid out in the field by Haley & Aldrich by taping distances from existing site features prior to the start of drilling. "As-drilled" boring locations and ground surface elevations at boring locations were determined in the field by MaineDOT using GPS survey equipment upon completion of drilling. The plan location data of the borings are summarized in Table I and are provided on the individual boring logs in Appendix A. Boring locations are shown on Figure 2.

The initial test borings were drilled by New England Boring Contractors (NEBC) of Hermon, Maine using a Mobile Drill B-53 track-mounted drill rig and the supplemental test borings were drilled by S.W. Cole Explorations, LLC (SWC) of Bangor, Maine using a Diedrich D-50 track-mounted drill rig. Test borings were advanced using cased wash drilling methods to depths ranging from approximately 6.0 to 44.0 ft

below existing ground surface (BGS) using 4-in. (HW-size) inside diameter (ID) steel casing. At three locations (HA22-1/HA22-1B, HA22-2, and HA22-5), the borings were drilled to bedrock and each sampled 5 ft of rock core. Soil samples were generally collected continuously through fill soils and at standard, 5-ft intervals thereafter, by driving a 1-3/8-in. inside diameter (ID) split-spoon sampler with a 140-lb hammer dropped from a height of 30 in., as indicated on the test boring logs. The number of hammer blows required to advance the sampler through each 6-in. interval was recorded and is provided on the boring logs. The uncorrected SPT N-value (N-uncorrected) is defined as the total number of blows required to advance the sampler through the middle 12 in. of the 24-in. sampling interval.

The drill rigs were equipped with calibrated automatic hammers. Based on the calibration information provided by NEBC and SWC, a theoretical hammer efficiency factor of 0.863 and 0.91 were used for the automatic hammers. The energy-corrected SPT N-value (N60) is equal to the uncorrected SPT N-value multiplied by the hammer efficiency factor (0.863 or 0.91) divided by 0.6 (i.e., 60 percent calculated hammer efficiency). Both the raw blow count (uncorrected N-values) and the corrected N-values are shown on the boring logs.

All soil and bedrock samples were collected and preserved in glass jars and wooden boxes, respectively. The samples that were not submitted for laboratory testing are available for review upon request. The available soil and bedrock samples are currently being stored at the Haley & Aldrich storage facility in Portland, Maine.

Five observation wells were installed in the completed boreholes HA22-1B, HA22-2, and HA22-8 through HA22-10 to provide information on the variability of static groundwater levels at the site and to collect samples for groundwater testing. The observation wells consisted of 2-in. ID, machine-slotted PVC pipe and solid PVC riser pipe extending approximately 2.4 to 3.1 ft above existing ground surface. The observation wells were outfitted with steel guard pipes and lock/cap assemblies. The observation well installation and groundwater monitoring reports are provided in Appendix B.

All drilling and sampling operations were performed in accordance with MaineDOT specifications.

Generalized Subsurface Conditions

SOIL CONDITIONS

The subsurface conditions encountered at the site during the recent subsurface exploration programs completed by Haley & Aldrich generally consist of the following geologic units presented in order of increasing depth below ground surface: fill, clay cap, landfill waste and cover, marine deposit (reworked), tidal marsh deposit, marine deposit (natural), fluvial deposit, glacial till, and bedrock. Refer to Table II for a summary of the soil units and encountered thicknesses at each test boring location. A general description of each soil/bedrock unit is provided separately, below. Detailed soil and bedrock descriptions are provided on the boring logs included in Appendix A.

Soil Unit	Approximate Range in Encountered Thickness (ft)	Generalized Description
Fill	4	Silty fine to medium SAND, trace coarse sand and gravel *(only encountered in test boring HA22-8, located at the edge of the public works storage area, outside the landfill footprint)*
Clay Cap	1 to 4	Medium stiff to very stiff silty CLAY, trace coarse gravel *(encountered in test borings HA22-1/1B, HA22-2, HA22-5, and HA22-6; the clay cap may be present at the location of HA22-7, however was not encountered likely due to sampling frequency)*
Landfill Waste and Cover	5 to 22	Medium stiff to hard silty CLAY, trace fine to coarse sand and gravel; loose to very dense fine to coarse SAND, trace silt; contains occasional cobble pieces, ash layers, and approximately trace to 40% waste consisting of newspaper, plastic bag, wood, glass, metal, wire, plastic netting, and insulation *(encountered in test borings HA22-1/1B, HA22-5, HA22-7, and HA22-10)*
Marine Deposit (Reworked)	11 to 13	Very stiff to hard silty CLAY *(encountered in test borings HA22-1/1B and HA22-7 in the central portion of the landfill)*
Tidal Marsh Deposit	> 4.6	Very loose silty fine SAND, trace medium sand *(only encountered in test boring HA22-10 east of the landfill)*
Marine Deposit (Natural)	3 to > 21	Medium stiff to hard silty CLAY, layered depositional structure, occasional fine sand lenses *(encountered in test borings HA22-1/1B, HA22-2, HA22-5, HA22-6, HA22-8, and HA22-9)*
Fluvial Deposit	7	Medium dense fine to coarse SAND, little silt, trace gravel; contains cobbles and boulders *(only encountered in test boring HA22-5 along the northern edge of the landfill)*
Glacial Till	1 to 4	Dense to very dense fine to coarse SAND, trace silt, little gravel, loosely bonded; contains cobbles *(encountered in test borings HA22-1/1B, HA22-5, and HA22-7)*
Bedrock		Top of bedrock surface encountered at depths ranging from approximately 9.0 to 38.7 ft BGS (El. -5.1 to El. 8.0).

Please note that soil descriptions provided on the logs In Appendix A represent subsurface conditions at the specific boring locations. The subsurface conditions encountered between test boring locations may vary from those encountered in the borings.

BEDROCK CONDITIONS

As stated previously, approximately 5 ft of bedrock was cored in three of the test borings. The recovered bedrock samples generally consisted of the following:

- Very hard to hard, fresh to slightly weathered, dark gray, porphyritic BASALT with occasional 1-in. thick clasts. Primary joints dip horizontally and are moderately closely spaced, open.
- Very hard to hard, slightly weathered, dark gray and white, aphanitic to coarse-grained basaltic TUFF BRECCIA. Primary joints dip horizontal to low angles and are very close to moderately closely spaced, open.

Rock quality designation (RQD) is a common parameter that is used to help assess the competency of sampled bedrock. RQD is defined as the sum of pieces of recovered bedrock greater than 4 in. in length divided by the total length of the bedrock core run. RQD values for the BASALT encountered at the site ranged from 43 to 85 percent (average of 66 percent) indicating poor to good rock quality. RQD values for the TUFF BRECCIA encountered at the site was 78 percent indicating good rock quality.

Photographs of the sampled bedrock are provided for reference in Appendix A.

GROUNDWATER CONDITIONS

As discussed previously, an observation well was installed in completed boreholes HA22-1B, HA22-2, and HA22-8 through HA22-10 to provide information on the static groundwater levels at the site. The measured water levels during the period 28 June 2022 to 7 September 2022 ranged from approximately 0.1 ft above ground surface to 27.3 ft below ground surface (El. -0.9 to El. 62.1). In addition, water was encountered during drilling in borings HA22-1B, HA22-2, and HA22-8 through HA-22-10, at depths ranging from approximately 3.6 to 29.7 ft BGS (El. -3.3 to El. 59.1).

Groundwater flow directions in the overburden were evaluated based on water level measurements collected from the installed monitoring wells on 15 August 2022. Groundwater elevations ranged from El. 55.6 in HA22-8 to El. 10.2 in HA22-9. As anticipated, groundwater generally flows in an easterly direction towards the Middle River.

In general, water levels may fluctuate with season, precipitation and local soil/bedrock conditions. Therefore, water levels may vary from those summarized above, shown on the boring logs included in Appendix A and shown on the groundwater monitoring reports included in Appendix B.

Groundwater Analytical Testing Program

Groundwater samples were collected from select monitoring wells including HA22-8, an upgradient well located in the western portion of the site in the vicinity of the Machias Public Works facility, and monitoring wells HA22-2, HA22-9 and HA22-10 located at the landfill toe-of-slope (see Figure 2). Groundwater samples were collected for laboratory analysis for various parameters to assess potential

groundwater impacts to areas downgradient of the landfill. Groundwater samples were collected from the monitoring wells on 15 and 16 August 2022.

Prior to sample collection, the wells were purged using dedicated polyethylene tubing and a variable-rate peristaltic pump. During the well purging, field measurements including pH, specific conductance, turbidity, dissolved oxygen, temperature, and oxidation-reduction potential (ORP) were monitored using a flow-through cell. Well evacuation continued until field parameters showed stable readings per the EPA low-flow sampling guidance. Copies of the low-flow sampling forms are included in Appendix D.

After the field parameters of the well discharge stabilized, groundwater samples were collected for laboratory analysis directly from the discharge of the pump tubing prior to the flow-through cell. The samples analyzed for dissolved metals were filtered in the field using disposable 0.45-micron filters. The samples were transferred directly to laboratory-supplied containers, labeled, and packaged in coolers with ice and chain of custody documentation for submission to the testing laboratory. The samples were submitted to Alpha Analytical Laboratories (Alpha) for analysis.

Based on discussions with MaineDOT and the Maine Department of Environmental Protection (MEDEP), groundwater samples from each of the four monitoring wells were sampled for the following parameters:

- Volatile Organic Compounds (VOCs) by Method 8260C
- Semi-Volatile Organic Compounds (SVOCs) by Method 8270D-SIM
- Pesticides by Method 8081B
- Herbicides by Method 8151A
- Dissolved Metals and Hardness
- Inorganics and Miscellaneous (Alkalinity, Nitrogen, Chemical Oxygen Demand, Total Organic Carbon, Bromide, Total Dissolved Solids, Nitrogen-Nitrates, Hexavalent Chromium, Chloride, Sulfate
- Perfluorinated Alkyl Acids (PFAS) by Alpha Method 134, LCMSMS-ID

The laboratory analytical results are summarized in Table III. Copies of the chain of custody documentation and the laboratory reports/analytical results are included in Appendix E.

ANALYTICAL RESULTS SUMMARY

Consistent with the MEDEP, the groundwater sample results collected in the vicinity of the landfill were compared to drinking water MEDEP Maximum Exposure Guidelines (MEGs) and EPA Maximum Contaminant Levels (MCLs) in addition to MEDEP Construction Worker Groundwater Remedial Action Guidelines (RAGs). For several parameters, including VOCs, SVOCs and herbicides, the laboratory detection limits exceeded the more stringent drinking water MEGs and MCLs for certain compounds as summarized below.

- **VOCs** – Various VOCs were detected in groundwater samples from each of the four wells. With the exception of naphthalene in HA22-8, all detected VOC concentrations were below the

applicable MEG, MCL and RAGs criteria. The detected concentration of naphthalene in the groundwater sample from HA22-8 was 49 ug/L, which exceeded both the MEG (10 ug/L) and the RAG (19ug/L).

- **SVOCs** – No SVOCs were detected in HA22-2. Various SVOCs were detected in HA22-8, HA22-9 and HA22-10, however, none of the detected SVOCs exceeded the applicable MEGs, MCLs or RAGs criteria.
- **Inorganic Compounds (Dissolved Metals)** – Metals including arsenic, chromium, hexavalent chromium, copper, lead and mercury were not detected above laboratory detection limits in any of the groundwater samples. Barium was detected in all four samples but only the detected concentration in HA22-10 (2.18 mg/L) exceeded the MEG (1 mg/L) and the MCL (2 mg/L). The detected concentration of cadmium in HA22-9 (0.005 mg/L) exceeded the MEG (0.001 mg/L). Iron was detected in all samples at concentrations ranging from 0.168 mg/L (HA22-2) to 148 mg/L (HA22-8). The detected concentration of iron in HA22-9 and HA22-10 exceeded the MEG (5 mg/L) and the detected concentration of iron in HA22-8 exceeded both the MEG and the RAG. Manganese concentrations ranged from 0.396 mg/L (HA22-10) to 39.6 mg/L (HA22-9) and concentrations in HA22-2, HA22-8 and HA22-10 exceeded the MEG (0.3 mg/L) and detected concentrations in HA22-9 exceeded both the MEG and RAG (37 mg/L). Sodium concentrations ranged from 412 mg/L (HA22-2) to 2,380 mg/L (HA22-9). Detected sodium concentrations in each of the four monitoring wells exceeded the applicable MEG (20 mg/L). Calcium was detected in each of the samples at concentrations ranging from 98.3 mg/L (HA22-10) to 478 mg/L (HA22-9). Hardness ranged from 335 mg/L (HA22-10) to 2,010 mg/L (HA22-9). Magnesium was detected in each of the samples at concentrations ranging 21.7 mg/L (HA22-10) to 198 mg/L (HA22-9). Potassium was detected at concentrations ranging from 9.42 mg/L (HA22-8) to 29.3 mg/L (HA22-9). There are no applicable criteria for calcium, hardness, magnesium or potassium.
- **Dissolved Gases and Other Landfill Parameters –** Dissolved gas ethene was not detected in any of the samples. Ethane was detected in HA22-9 (0.51 ug/L) and HA22-10 (2.63 ug/L) and methane was detected at concentrations ranging from 32.6 ug/L (HA22-2) to 9,310 ug/L (HA22-8). There is no applicable criteria for ethene, ethane or methane. None of the detected concentrations of ammonia exceed the applicable MEG. Detected concentrations of both nitrate and nitrite were below the MEG, MCL and RAG criteria. Total dissolved solids (TDS) were detected at concentrations ranging from 1,700 mg/L (HA22-2) to 7,200 mg/L (HA22-9). Bicarbonate concentrations ranged from 64.2 mg/L (HA22-8) to 405 mg/L (HA22-2). Bromide concentrations ranged from 1.83 mg/L (HA22-2) to 9.39 mg/L (HA22-8). Detected concentrations of calcium carbonate ranged from 64.2 mg/L (HA22-8) to 405 mg/L (HA22-2). Chemical oxygen demand (COD) ranged from 47 mg/L (HA22-2) to 370 mg/L (HA22-9). Chloride concentrations ranged from 838 mg/L (HA22-2) to 4,190 mg/L (HA22-9). Total organic carbon (TOC) concentrations ranged from 3.31.mg/L (HA22-2) to 4.53 mg/L (HA22-10). There is no applicable criteria for TDS, bicarbonate, bromide, calcium carbonate, COD, chloride or TOC.
- **Herbicides and Pesticides** – No herbicides or pesticides were detected above the laboratory reporting limits.

- **PFAS** – Various PFAS compounds were detected in samples collected from each of the monitoring wells. Total PFAS ranged from 26.5 ng/L (HA22-8) to 181 ng/L (HA22-10). The detection of PFOS in HA22-10 (72 ng/L) exceeded the MEG (70 ng/L) and the detection of PFOA in both HA22-2 (84 ng/L) and HA22-10 (71.2 ng/L) exceed the MEG criteria (70 ng/L).

  The Maine Center for Disease Control (CDC) has implemented an interim drinking water standard of 20 ng/L-parts per trillion (ppt; alone or in combination) for the six regulated PFAS contaminants that include: perfluorooctanoic acid (PFOA), perfluorooctane sulfonic acid (PFOS), perfluorohexane sulfonic acid (PFHxS), perfluorononanoic acid (PFNA), perfluoroheptanoic acid (PFHpA) and perfluorodecanoic acid (PFDA). Total PFAS (6) results ranged from 26.5 ng/L (HA22-8) to 181 ng/L (HA22-10) with all samples exceeding the CDC 20 ng/L standard. Total PFAS (6) results for the remaining samples from downgradient wells HA22-2 and HA22-9 were detected at 173 ng/L and 123 ng/L, respectively. Based on the comparison of the Total PFAS (6) results from the upgradient well (HA22-8) to the three downgradient landfill wells (HA22-2, HA22-9 and HA22-10), it appears that the landfill debris is contributing to the increased concentrations of Total PFAS (6).

Based on the comparison to the drinking water MEGs and MCLs of the groundwater sample analytical results collected from monitoring wells located along the toe of the existing landfill slope, it does not appear that groundwater beneath the landfill would have a significant environmental impact to downgradient surface water quality associated with the Middle River east of the landfill.

Geotechnical Laboratory Testing Program

A geotechnical laboratory testing program was undertaken by Haley & Aldrich on representative soil samples collected during the subsurface exploration program to aid in soil classification and determination of engineering soil properties. All laboratory testing was performed in accordance with applicable American Society for Testing Materials (ASTM) testing procedures by GeoTesting Express, Inc. (GTX) of Acton, Massachusetts. Laboratory test results are provided in Appendix C and are shown on boring logs in Appendix A. A summary of laboratory test results is provided below.

Laboratory Test	ASTM Test Designation	Soil Unit	No. of Completed Tests	Range in Test Results[1]
Atterberg Limits	ASTM D 4318	Marine Deposit	3	38 < LL < 45 20 < PL < 23 18 < PI < 22

Notes:
[1] LL = Liquid Limit; PL = Plastic Limit; PI = Plasticity Index

Geotechnical Evaluations

Geotechnical analyses were completed to evaluate global stability of the landfill under current and future water level conditions as described below. Engineering calculations that support the evaluations outlined in this section are provided for reference in Appendix F.

Static and pseudo-static seismic stability evaluations were conducted at two critical sections in the northeast and southeast edges of the existing landfill. These areas were identified as being "critical" from a geotechnical standpoint as they had the steepest slopes and were closest to the potential new, higher inundation area. A series of computer-assisted, two-dimensional global stability evaluations were performed using the computer program Slide2 Version 9 to evaluate the likelihood of global stability failures at the site.

A typical soil profile was developed based on the subsurface conditions encountered in the test borings at each cross section. The following physical and strength properties were used to complete the global stability evaluations:

Material	Unit Weight (pcf)	Friction Angle (degrees)	Undrained Shear Strength (psf)
Clay Cap	120	-	775
Landfill Waste and Cover	120	28	OR 550
Marine Deposit (reworked)	120	-	3,000
Marine Deposit (natural)	120	-	1,500
Fluvial	120	35	-
Glacial Till	130	38	-
Bedrock	infinite strength		

The landfill waste and cover material sampled in borings included both cohesive and cohesionless soils. As shown in the table below, modeling the landfill waste and cover layer stratum with cohesive properties yielded more conservative results at Section A-A, therefore the cohesive properties were used for the remainder of our evaluations.

Two groundwater conditions were modeled at each section. A model with current groundwater levels was run at each cross section based on conditions observed in observation wells during the recent subsurface exploration program. A model with groundwater level equal to high tide plus storm surge plus sea level rise water level of El. 14.7 was also run at each section. This higher elevation was provided to us by MaineDOT.

The calculated global stability factors of safety (FoS) values at sections A-A and B-B are summarized below.

Section	Landfill Waste and Cover Properties	Calculated FoS	
		Static	Seismic
SE Landfill Section A-A (Current Groundwater Level; El. 12.1)	cohesive	1.53	1.24
SE Landfill Section A-A (Current Groundwater Level; El. 12.1)	cohesionless	2.04	1.66
SE Landfill Section A-A (Future High Tide/Storm/SLR; El. 14.7)	cohesive	1.53	1.24
NE Landfill Section B-B (Current Groundwater Level; El. 11.0)	cohesive	1.86	1.36
NE Landfill Section B-B (Future High Tide/Storm/SLR; El. 14.7)	cohesive	1.86	1.36

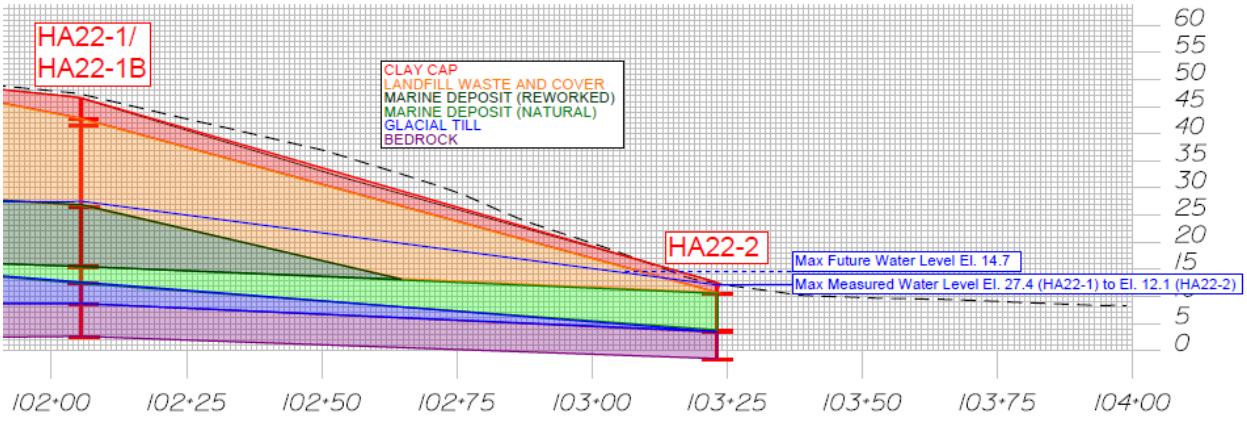
The factor of safety for pseudo-static seismic load cases was calculated using a horizontal acceleration coefficient, k_h, of 0.06g (i.e., one half of the acceleration coefficient, As). A value of As/2 was selected in accordance with AASHTO LRFD guidance in Section 11.6.5.2.2; the reduction from As is due to soil slope flexibility and the fact that the peak ground acceleration during an earthquake lasts only for a very short period of time.

The minimum required factor of safety as specified by both AASHTO LRFD and the MaineDOT BDG for embankments under static conditions which do not support structures is 1.3. The minimum required factor of safety for landfills under static conditions is typically 1.5. The minimum required factor of safety for embankments subjected to pseudo-static seismic loading is 1.1 (FHWA GEC No. 3).

The results indicate that the current and future conditions meet the required minimum acceptable factors of safety. Note that the increase in groundwater level did not impact the factors of safety. Although the water level at the toe of the landfill is expected to increase, the water level within the landfill where the critical failure surfaces are located is currently above El. 14.7, and is not expected to change significantly, as illustrated in the sketch below.

Per your request, we completed additional technical evaluations to determine the sensitivity of increased groundwater levels on the global stability results. The results of the evaluations indicate that elevated water levels outside the landfill (i.e., at and outboard of the toe of the landfill slope) would not negatively impact global stability factors of safety. Elevated water levels within the landfill (i.e., inboard of the landfill toe) were found to have a slight negative impact on the factor of safety, but the levels would need to be raised considerably (i.e., up to approx. El. 31, about 16 ft above maximum inundation flood level and 11 ft above measured stabilized water levels within the landfill) to cause an unsatisfactory factor of safety.

In our evaluations we assumed that no changes would be made to the landfill and adjacent ground surface. We also assumed that since the groundwater sample analytical results came back favorably, it would not be necessary to remove any of the waste (i.e., no excavation into the landfill). Note that based on the subsurface conditions encountered in the borings, the majority of the waste seems to be located above the future water level (El. 14.7). Based on interpolation between borings, there may be a small area of waste present below the future water level at the toe of slope at Section A-A (bottom interpolated at approximately El. 10.6), as shown in the sketch below.



Note that although increased water levels are not anticipated to cause global stability problems, they may cause surficial erosion/scour at the toe of the landfill. To protect against erosion/scour, we recommend placing a 3 ft-thick layer of plain riprap on the slopes from the existing toe of slope up to El. 15 (slightly above the maximum inundation water level). Refer to MaineDOT standard detail for "Stone Scour Protection, 610(02)" for additional information.

Conclusions

- Based on the comparison to the drinking water MEGs and MCLs of the groundwater sample analytical results collected from monitoring wells located along the toe of the existing landfill slope, it does not appear that groundwater beneath the landfill would have a significant environmental impact to downgradient surface water quality associated with the Middle River east of the landfill.

- The results of the geotechnical evaluations indicate that the current and future conditions meet the required minimum acceptable factors of safety. Evaluations indicate that the global stability factor of safety is not sensitive to changes in water level.

Limitations

This report is prepared for the exclusive use of MaineDOT relative to the subject project. There are no intended beneficiaries other than MaineDOT. Haley & Aldrich shall owe no duty whatsoever to any other person or entity on account of the Agreement or the report. Use of this report by any person or entity other than MaineDOT for any purpose whatsoever is expressly forbidden unless such other person or entity obtains written authorization from MaineDOT and Haley & Aldrich. Use of this report by such other person or entity without the written authorization of MaineDOT and Haley & Aldrich shall be at such other person's or entities sole risk and shall be without legal exposure or liability to Haley & Aldrich.

Use of this report by any person or entity, including by MaineDOT, for a purpose other than relative to the subject project is expressly prohibited unless such person or entity obtains written authorization from Haley & Aldrich indicating that the report is adequate for such other use. Use of this report by any other person or entity for such other purpose without written authorization by Haley & Aldrich shall be at such person's or entities sole risk and shall be without legal exposure or liability to Haley & Aldrich.

The information provided herein is based, in part, upon the data obtained from the referenced subsurface explorations. The nature and extent of variations between explorations may not become evident until construction. If variations then appear, it may be necessary to reevaluate the recommendations of this report.

Closure

We appreciate the opportunity to continue to provide MaineDOT services on this project. Please do not hesitate to call if you have any questions or comments.

Sincerely yours,
HALEY & ALDRICH, INC.

Erin A. Force, P.E.
Senior Geotechnical Engineer

David A. Dearden
Senior Environmental Geologist

Wayne A. Chadbourne, P.E.
Lead Quality Control Engineer

Enclosures:

Table I –	Subsurface Exploration Location Data
Table II –	Subsurface Exploration Subsurface Data
Table III –	Summary of Groundwater Analytical Results
Figure 1 –	Project Locus
Figure 2 –	Site and Subsurface Exploration Location Plan
Appendix A –	Test Boring Logs and Rock Core Photographs
Appendix B –	Observation Well Installation and Groundwater Monitoring Reports
Appendix C –	Geotechnical Laboratory Test Results
Appendix D –	Low Flow Field Sampling Forms
Appendix E –	Groundwater Analytical Results
Appendix F –	Geotechnical Design Calculations

TABLES

TABLE I
Subsurface Exploration Location Data
Machias Landfill Investigation
Machias Dike Bridge
MaineDOT WIN 16714.00
Machias, Maine

Haley & Aldrich, Inc. File No.: 0130749-009

Test Boring No.[1,5]	Ground Surface Elevation (ft)[2,3]	Coordinates[4]	
		Northing	Easting
HA22-1	46.7	324,629	2,402,438
HA22-1B	46.7	324,629	2,402,438
HA22-2	12.6	324,616	2,402,555
HA22-5	26.4	324,780	2,402,399
HA22-6	17.0	324,827	2,402,414
HA22-7	52.5	324,632	2,402,378
HA22-8	64.5	324,623	2,401,655
HA22-9	17.5	324,821	2,402,411
HA22-10	19.2	324,502	2,402,502

Notes:

[1] Test boring locations are shown on Figure 2, Site and Subsurface Exploration Location Plan.

[2] Ground surface elevations at test boring locations were determined in the field by MaineDOT using GPS survey equipment.

[3] Elevations are measured in feet and reference the North American Vertical Datum of 1988 (NAVD 88).

[4] As-drilled coordinates of test borings were determined by MaineDOT using GPS survey equipment, are measured in feet and reference NAD83, Maine 2000 East Zone coordinate system.

[5] Test boring HA22-3 and HA22-4 were laid out in the field as alternate boring locations, to be drilled depending on conditions encountered and available time. These two test borings were not drilled.

	Individual	Date
Prepared By:	EMS	10/4/2022
Checked By:	EAF	10/18/2022
Reviewed By:	WAC	10/20/2022

TABLE II
Subsurface Exploration Subsurface Data
Machias Landfill Investigation
Machias Dike Bridge
MaineDOT WIN 16714.00
Machias, Maine

Haley & Aldrich, Inc. File No.: 0130749-009

Test Boring No.[1,8]	Ground Surface Elevation (ft)[2,3]	Total Exploration Depth (ft)	El. Bottom of Exploration	Fill[4]			Clay Cap[4]			Landfill Waste and Cover[4]			Marine Deposit (Reworked)[4]			Tidal Marsh Deposit[4]			Marine Deposit (Natural)[4,5]			Fluvial[4,5]			Glacial Till[4,5]			Bedrock[4,5]	
				Depth to Top	El. of Top[2,3]	Thickness	Depth to Top	El. of Top[2,3]	Thickness	Depth to Top	El. of Top[2,3]	Thickness	Depth to Top	El. of Top[2,3]	Thickness	Depth to Top	El. of Top[2,3]	Thickness[6]	Depth to Top	El. of Top[2,3]	Thickness[6]	Depth to Top	El. of Top[2,3]	Thickness	Depth to Top	El. of Top[2,3]	Thickness[6]	Depth to Top	El. of Top[2,3]
				(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
HA22-1 / HA22-1B	46.7	44.0	2.7	NE	NE	NE	0.0	46.7	4.0	4.0	42.7	16.3	20.3	26.4	11.2	NE	NE	NE	31.5	15.2	3.1	NE	NE	NE	34.6	12.1	4.1	38.7	8.0
HA22-2	12.6	15.3	-2.7	NE	NE	NE	0.0	12.6	2.0	NE	NE	NE	NE	NE	NE	NE	NE	NE	2.0	10.6	7.0	NE	NE	NE	NE	NE	NE	9.0	3.6
HA22-5	26.4	37.5	-11.1	NE	NE	NE	0.0	26.4	2.0	2.0	24.4	5.7	NE	NE	NE	NE	NE	NE	7.7	18.7	16.0	23.7	2.7	6.8	30.5	-4.1	1.0	31.5	-5.1
HA22-6	17.0	6.0	11.0	NE	NE	NE	0.0	17.0	1.0	NE	NE	NE	NE	NE	NE	NE	NE	NE	1.0	16.0	> 5.0	--	--	--	--	--	--	--	--
HA22-7	52.5	35.6	16.9	NE	NE	NE	NE[9]	NE	NE	0.0	52.5	22.0	22.0	30.5	13.0	NE	NE	NE	NE	NE	NE	NE	NE	NE	35.0	17.5	> 0.6	--	--
HA22-8[7]	64.5	17.6	46.9	0.0	64.5	4.0	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	4.0	60.5	> 13.6	--	--	--	--	--	--	--	--
HA22-9[7]	17.5	21.4	-3.9	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.0	17.5	> 21.4	--	--	--	--	--	--	--	--
HA22-10[7]	19.2	9.6	9.6	NE	NE	NE	NE	NE	NE	0.0	19.2	5.0	NE	NE	NE	5.0	14.2	> 4.6	--	--	--	--	--	--	--	--	--	--	--

Notes:
[1] Test boring locations are shown on Figure 2, Site and Subsurface Exploration Location Plan.
[2] Ground surface elevations at test boring locations were determined in the field by MaineDOT using GPS survey equipment.
[3] Elevations are measured in feet and reference the North American Vertical Datum of 1988 (NAVD 88).
[4] "NE" indicates stratum was not encountered in test boring.
[5] "--" indicates test boring was not drilled deep enough to determine presence of stratum.
[6] "> 32.8" indicates test boring was not drilled deep enough to determine entire stratum thickness. Actual total stratum thickness greater than value shown.
[7] HA22-8 through HA22-10 were drilled to install wells for groundwater sampling. Minimal soil sample data was collected. Soil and strata descriptions determined from drilling cutting observations.
[8] Test boring HA22-3 and HA22-4 were laid out in the field as alternate boring locations, to be drilled depending on conditions encountered and available time. These two test borings were not drilled.
[9] Clay cap not encountered in HA22-8 likely due to sampling frequency.

	Individual	Date
Prepared By:	EMS	10/4/2022
Checked By:	EAF	10/18/2022
Reviewed By:	WAC	10/20/2022

TABLE III
Summary of Groundwater Analytical Results
Machias Landfill Investigation
Machias Dike Bridge
MaineDOT WIN 16714.00
Machias, Maine

Location Name	Aug-22				MEGs for Drinking Water	Maximum Contaminant Level (MCLs)	Construction Worker Groundwater RAGs
	HA22-2(OW)	HA22-8(OW)	HA22-9(OW)	HA22-10(OW)			
Lab Sample ID	L2244025-01 L2244025-05	L2244025-02 L2244025-06	L2244025-03 L2244025-07	L2244025-04 L2244025-08			
Volatile Organic Compounds (ug/L)							
1,1,1,2-Tetrachloroethane	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	10	NA	620
1,1,1-Trichloroethane	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	10000	200	29000
1,1,2,2-Tetrachloroethane	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	2	NA	90
1,1,2-Trichloroethane	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	6	5	12
1,1-Dichloroethane	**1.6**	ND (0.75)	ND (0.75)	**1.3**	60	NA	2200
1,1-Dichloroethene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	40	7	960
1,1-Dichloropropene	ND (1)	ND (1)	ND (1)	ND (1)	NA	NA	NA
1,2,3-Trichlorobenzene	ND (1)	ND (1)	ND (1)	ND (1)	NA	NA	2900
1,2,3-Trichloropropane	ND (1) [A]	ND (1) [A]	ND (1) [A]	ND (1) [A]	0.01	NA	2.1
1,2,4-Trichlorobenzene	ND (1)	ND (1)	ND (1)	ND (1)	70	70	140
1,2,4-Trimethylbenzene	ND (1)	ND (1)	ND (1)	ND (1)	NA	NA	1000
1,2-Dibromo-3-chloropropane (DBCP)	ND (1) [AB]	ND (1) [AB]	ND (1) [AB]	ND (1) [AB]	0.4	0.2	1.2
1,2-Dibromoethane (Ethylene Dibromide)	ND (1) [AB]	ND (1) [AB]	ND (1) [AB]	ND (1) [AB]	0.2	0.05	8.7
1,2-Dichlorobenzene	ND (1)	ND (1)	ND (1)	ND (1)	200	600	12000
1,2-Dichloroethane	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	4	5	140
1,2-Dichloropropane	ND (1)	ND (1)	ND (1)	ND (1)	10	5	22
1,3,5-Trichlorobenzene	ND (1)	ND (1)	ND (1)	ND (1)	40	NA	NA
1,3,5-Trimethylbenzene	ND (1)	ND (1)	ND (1)	ND (1)	NA	NA	1100
1,3-Dichlorobenzene	ND (1)	ND (1)	ND (1)	ND (1)	1	NA	6200
1,3-Dichloropropane	ND (1)	ND (1)	ND (1)	ND (1)	100	NA	100000
1,4-Dichlorobenzene	ND (1)	ND (1)	ND (1)	ND (1)	70	75	400
2,2-Dichloropropane	ND (1)	ND (1)	ND (1)	ND (1)	NA	NA	NA
2-Butanone (Methyl Ethyl Ketone)	ND (5)	ND (5)	ND (5)	ND (5)	4000	NA	9000
2-Chlorotoluene	ND (1)	ND (1)	ND (1)	ND (1)	100	NA	3300
2-Hexanone (Methyl Butyl Ketone)	ND (5)	ND (5)	ND (5)	ND (5)	NA	NA	240
2-Phenylbutane (sec-Butylbenzene)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	100000
4-Chlorotoluene	ND (1)	ND (1)	ND (1)	ND (1)	500	NA	100000
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	ND (5)	ND (5)	ND (5)	ND (5)	500	NA	5800
Acetone	ND (5)	ND (5)	ND (5)	ND (5)	6000	NA	100000
Acrylonitrile	ND (5) [A]	ND (5) [A]	ND (5) [A]	ND (5) [A]	0.6	NA	11
Benzene	ND (0.5)	ND (0.5)	**0.55**	**0.56**	4	5	350
Bromobenzene	ND (1)	ND (1)	ND (1)	ND (1)	NA	NA	1200
Bromodichloromethane	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	6	80	130
Bromoform	ND (1)	ND (1)	ND (1)	ND (1)	40	80	5500
Bromomethane (Methyl Bromide)	ND (1)	ND (1)	ND (1)	ND (1)	10	NA	490
Carbon disulfide	ND (1)	ND (1)	ND (1)	ND (1)	600	NA	3100
Carbon tetrachloride	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	5	5	700
Chlorobenzene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	100	100	2600
Chlorobromomethane	ND (1)	ND (1)	ND (1)	ND (1)	100	NA	600
Chloroethane	**2.2**	ND (1)	**1.2**	**4**	7	NA	16000
Chloroform (Trichloromethane)	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	70	80	170
Chloromethane (Methyl Chloride)	ND (2)	ND (2)	ND (2)	ND (2)	20	NA	11000
cis-1,2-Dichloroethene	ND (0.5)	ND (0.5)	**0.64**	ND (0.5)	10	70	3700
cis-1,3-Dichloropropene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	NA
Cymene (p-Isopropyltoluene)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	70	NA	NA
Dibromochloromethane	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	4	80	53000
Dibromomethane	ND (1)	ND (1)	ND (1)	ND (1)	NA	NA	280
Dichlorodifluoromethane (CFC-12)	ND (2)	ND (2)	ND (2)	ND (2)	1000	NA	5400
Diisopropyl ether (DIPE)	ND (1)	ND (1)	ND (1)	ND (1)	NA	NA	3700
Ethyl Ether	**2**	ND (1)	**19**	**1.9**	NA	NA	14000
Ethylbenzene	ND (0.5)	**0.82**	ND (0.5)	ND (0.5)	30	700	1400
Hexachlorobutadiene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	4	NA	230
Iodomethane	ND (5)	ND (5)	ND (5)	ND (5)	NA	NA	NA
Isopropylbenzene (Cumene)	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	500
Methyl Tert Butyl Ether (MTBE)	ND (1)	ND (1)	ND (1)	ND (1)	35	NA	13000
Methylene chloride (Dichloromethane)	ND (3)	ND (3)	ND (3)	ND (3)	40	5	4900
Naphthalene	ND (1)	**49** [AC]	ND (1)	ND (1)	10	NA	19
n-Butylbenzene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	100000
n-Propylbenzene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	4900
Styrene	ND (1)	ND (1)	ND (1)	ND (1)	100	100	15000
Tert-Amyl Methyl Ether (TAME)	ND (1)	ND (1)	ND (1)	ND (1)	NA	NA	NA
Tert-Butyl Alcohol (tert-Butanol)	ND (10)	ND (10)	**15**	ND (10)	NA	NA	NA
Tert-Butyl Ethyl Ether (ETBE)	ND (1)	ND (1)	ND (1)	ND (1)	NA	NA	NA
tert-Butylbenzene	ND (1)	ND (1)	ND (1)	ND (1)	NA	NA	25000
Tetrachloroethene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	40	5	250
Tetrahydrofuran	**2.7**	ND (2)	**15**	**2.6**	600	NA	16000
Toluene	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	600	1000	24000
trans-1,2-Dichloroethene	ND (0.75)	ND (0.75)	ND (0.75)	ND (0.75)	100	100	3900
trans-1,3-Dichloropropene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	NA
trans-1,4-Dichloro-2-butene	ND (2.5) [C]	ND (2.5) [C]	ND (2.5) [C]	ND (2.5) [C]	NA	NA	1
Trichloroethene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	4	5	12
Trichlorofluoromethane (CFC-11)	ND (1)	ND (1)	ND (1)	ND (1)	2000	NA	5900
Vinyl acetate	ND (5)	ND (5)	ND (5)	ND (5)	7000	NA	180
Vinyl chloride	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	0.2	2	0.22
Xylene (total)	ND (1)	ND (1)	ND (1)	ND (1)	1000	10000	2100

TABLE III
Summary of Groundwater Analytical Results
Machias Landfill Investigation
Machias Dike Bridge
MaineDOT WIN 16714.00
Machias, Maine

Location Name	Aug-22				MEGs for Drinking Water	Maximum Contaminant Level (MCLs)	Construction Worker Groundwater RAGs
	HA22-2(OW)	HA22-8(OW)	HA22-9(OW)	HA22-10(OW)			
Lab Sample ID	L2244025-01 L2244025-05	L2244025-02 L2244025-06	L2244025-03 L2244025-07	L2244025-04 L2244025-08			
Semi-Volatile Organic Compounds (ug/L)							
1,2,4-Trichlorobenzene	ND (5)	ND (5)	ND (5)	ND (5)	70	70	140
1,2-Dichlorobenzene	ND (2)	ND (2)	ND (2)	ND (2)	200	600	12000
1,3-Dichlorobenzene	ND (2) [A]	ND (2) [A]	ND (2) [A]	ND (2) [A]	1	NA	6200
1,4-Dichlorobenzene	ND (2)	ND (2)	ND (2)	ND (2)	70	75	400
2,2'-oxybis(1-Chloropropane)	ND (2)	ND (2)	ND (2)	ND (2)	300	NA	NA
2,4,5-Trichlorophenol	ND (5)	ND (5)	ND (5)	ND (5)	700	NA	100000
2,4,6-Trichlorophenol	ND (5)	ND (5)	ND (5)	ND (5)	7	NA	690
2,4-Dichlorophenol	ND (5)	ND (5)	ND (5)	ND (5)	20	NA	27000
2,4-Dimethylphenol	ND (5)	ND (5)	ND (5)	ND (5)	100	NA	100000
2,4-Dinitrophenol	ND (20) [A]	ND (20) [A]	ND (20) [A]	ND (20) [A]	10	NA	100000
2,4-Dinitrotoluene	ND (5) [A]	ND (5) [A]	ND (5) [A]	ND (5) [A]	1	NA	15000
2,6-Dinitrotoluene	ND (5) [A]	ND (5) [A]	ND (5) [A]	ND (5) [A]	0.5	NA	2700
2-Chlorophenol	ND (2)	ND (2)	ND (2)	ND (2)	40	NA	29000
2-Methylphenol (o-Cresol)	ND (5)	ND (5)	ND (5)	ND (5)	40	NA	100000
2-Nitroaniline	ND (5)	ND (5)	ND (5)	ND (5)	NA	NA	NA
2-Nitrophenol	ND (10)	ND (10)	ND (10)	ND (10)	NA	NA	NA
3&4-Methylphenol	ND (5)	ND (5)	ND (5)	ND (5)	NA	NA	NA
3,3'-Dichlorobenzidine	ND (5) [A]	ND (5) [A]	ND (5) [A]	ND (5) [A]	0.8	NA	2000
3-Nitroaniline	ND (5)	ND (5)	ND (5)	ND (5)	NA	NA	NA
4,6-Dinitro-2-methylphenol	ND (10)	ND (10)	ND (10)	ND (10)	NA	NA	NA
4-Bromophenyl phenyl ether	ND (2)	ND (2)	ND (2)	ND (2)	NA	NA	NA
4-Chloro-3-methylphenol	ND (2)	ND (2)	ND (2)	ND (2)	NA	NA	100000
4-Chloroaniline	ND (5) [A]	ND (5) [A]	ND (5) [A]	ND (5) [A]	2	NA	2700
4-Chlorophenyl phenyl ether	ND (2)	ND (2)	ND (2)	ND (2)	NA	NA	NA
4-Nitroaniline	ND (5)	ND (5)	ND (5)	ND (5)	NA	NA	100000
4-Nitrophenol	ND (10)	ND (10)	ND (10)	ND (10)	60	NA	NA
Aniline	ND (2)	ND (2)	ND (2)	ND (2)	NA	NA	86000
Azobenzene	ND (2)	ND (2)	ND (2)	ND (2)	NA	NA	NA
Benzidine	ND (20)	ND (20)	ND (20)	ND (20)	NA	NA	NA
Benzoic acid	ND (50)	ND (50)	ND (50)	ND (50)	30000	NA	100000
Benzyl Alcohol	ND (2)	ND (2)	ND (2)	ND (2)	NA	NA	100000
Biphenyl	ND (2)	ND (2)	ND (2)	ND (2)	400	NA	29
bis(2-Chloroethoxy)methane	ND (5)	ND (5)	ND (5)	ND (5)	NA	NA	NA
bis(2-Chloroethyl)ether	ND (2) [A]	ND (2) [A]	ND (2) [A]	ND (2) [A]	0.3	NA	54
bis(2-Ethylhexyl)phthalate	ND (3)	ND (3)	**5.6**	ND (3)	30	6	100000
Butyl benzylphthalate	ND (5)	ND (5)	ND (5)	ND (5)	200	NA	100000
Carbazole	ND (2)	ND (2)	ND (2)	**2.1**	NA	NA	13000
Dibenzofuran	ND (2)	ND (2)	ND (2)	ND (2)	NA	NA	1200
Diethyl phthalate	ND (5)	ND (5)	ND (5)	ND (5)	6000	NA	100000
Dimethyl phthalate	ND (5)	ND (5)	ND (5)	ND (5)	NA	NA	NA
Di-n-butylphthalate	ND (5)	ND (5)	ND (5)	ND (5)	700	NA	100000
Di-n-octyl phthalate	ND (5)	ND (5)	ND (5)	ND (5)	NA	NA	100000
Hexachlorocyclopentadiene	ND (20)	ND (20)	ND (20)	ND (20)	40	50	NA
Isophorone	ND (5)	ND (5)	ND (5)	ND (5)	400	NA	100000
Nitrobenzene	ND (2) [A]	ND (2) [A]	ND (2) [A]	ND (2) [A]	1	NA	NA
N-Nitrosodimethylamine	ND (2)	ND (2)	ND (2)	ND (2)	NA	NA	NA
N-Nitrosodi-n-propylamine	ND (5)	ND (5)	ND (5)	ND (5)	NA	NA	NA
N-Nitrosodiphenylamine	ND (2)	ND (2)	ND (2)	ND (2)	NA	NA	100000
Phenol	ND (5)	ND (5)	ND (5)	ND (5)	2000	NA	100000
Pyridine	ND (3.5)	ND (3.5)	ND (3.5)	ND (3.5)	NA	NA	NA
Semi-Volatile Organic Compounds (SIM) (ug/L)							
1-Methylnaphthalene	ND (0.1)	**3.1**	ND (0.1)	ND (0.1)	NA	NA	8800
2-Chloronaphthalene	ND (0.2)	ND (0.2)	ND (0.2)	ND (0.2)	NA	NA	81000
2-Methylnaphthalene	ND (0.1)	**1.6**	**0.12**	ND (0.1)	30	NA	1500
Acenaphthene	ND (0.1)	**1.6**	ND (0.1)	ND (0.1)	400	NA	74000
Acenaphthylene	ND (0.1)	**0.2**	ND (0.1)	ND (0.1)	NA	NA	71000
Anthracene	ND (0.1)	**0.2**	ND (0.1)	ND (0.1)	2000	NA	100000
Benzo(a)anthracene	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.5	NA	470
Benzo(a)pyrene	ND (0.1) [A]	ND (0.1) [A]	ND (0.1) [A]	ND (0.1) [A]	0.05	0.2	11000
Benzo(b)fluoranthene	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.5	NA	100000
Benzo(g,h,i)perylene	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	NA	NA	100000
Benzo(k)fluoranthene	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	5	NA	100000
Chrysene	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	50	NA	100000
Dibenz(a,h)anthracene	ND (0.1) [A]	ND (0.1) [A]	ND (0.1) [A]	ND (0.1) [A]	0.05	NA	26000
Fluoranthene	ND (0.1)	**0.19**	ND (0.1)	ND (0.1)	300	NA	100000
Fluorene	ND (0.1)	**1.4**	ND (0.1)	ND (0.1)	300	NA	100000
Hexachlorobenzene	ND (0.8) [A]	ND (0.8) [A]	ND (0.8) [A]	ND (0.8) [A]	0.2	1	13
Hexachlorobutadiene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	4	NA	230
Hexachloroethane	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	5	NA	470
Indeno(1,2,3-cd)pyrene	ND (0.1)	ND (0.1)	ND (0.1)	ND (0.1)	0.5	NA	100000
Naphthalene	ND (0.1)	**5.9**	**0.29**	ND (0.1)	10	NA	19
Pentachlorophenol	ND (0.8)	ND (0.8)	ND (0.8)	ND (0.8)	0.9	1	140
Phenanthrene	ND (0.1)	**1.2**	ND (0.1)	ND (0.1)	NA	NA	58000
Pyrene	ND (0.1)	**0.18**	ND (0.1)	ND (0.1)	200	NA	36000

TABLE III
Summary of Groundwater Analytical Results
Machias Landfill Investigation
Machias Dike Bridge
MaineDOT WIN 16714.00
Machias, Maine

Location Name	Aug-22				MEGs for Drinking Water	Maximum Contaminant Level (MCLs)	Construction Worker Groundwater RAGs
	HA22-2(OW)	HA22-8(OW)	HA22-9(OW)	HA22-10(OW)			
Lab Sample ID	L2244025-01 L2244025-05	L2244025-02 L2244025-06	L2244025-03 L2244025-07	L2244025-04 L2244025-08			
Inorganic Compounds (mg/L)							
Arsenic, Dissolved	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	0.01	0.01	5.8
Barium, Dissolved	**0.161**	**0.314**	**0.739**	**2.18** [AB]	1	2	100
Cadmium, Dissolved	ND (0.005) [A]	ND (0.005) [A]	**0.005** [A]	ND (0.005) [A]	0.001	0.005	0.94
Calcium, Dissolved	**122**	**165**	**478**	**98.3**	NA	NA	NA
Chromium, Dissolved	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.02	0.1	NA
Chromium VI (Hexavalent), Dissolved	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.02	NA	0.69
Copper, Dissolved	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.5	1.3	100
Hardness, Dissolved	**624**	**680**	**2010**	**335**	NA	NA	NA
Iron, Dissolved	**0.168**	**148** [AC]	**5.65** [A]	**96.6** [A]	5	NA	100
Lead, Dissolved	ND (0.01)	ND (0.01)	ND (0.01)	ND (0.01)	0.01	0.015	NA
Magnesium, Dissolved	**77.6**	**65**	**198**	**21.7**	NA	NA	NA
Manganese, Dissolved	**4.07** [A]	**35.9** [A]	**39.6** [AC]	**0.396** [A]	0.3	NA	37
Mercury, Dissolved	ND (0.0002)	ND (0.0002)	ND (0.0002)	ND (0.0002)	NA	0.002	0.0021
Potassium, Dissolved	**14.5**	**9.42**	**29.3**	**25.6**	NA	NA	NA
Sodium, Dissolved	**412** [A]	**1870** [A]	**2380** [A]	**500** [A]	20	NA	NA
Dissolved Gases (ug/L)							
Ethane	ND (0.5)	ND (0.5)	**0.51**	**2.63**	NA	NA	NA
Ethene	ND (0.5)	ND (0.5)	ND (0.5)	ND (0.5)	NA	NA	NA
Methane	**32.6**	**9310**	**1030**	**4090**	NA	NA	NA
Other							
Total Dissolved Solids (TDS) (mg/L)	**1700**	**5500**	**7200**	**1800**	NA	NA	NA
Ammonia, Total (mg/L)	**0.803**	**5.89**	**0.15**	**8.95**	30	NA	NA
Bicarbonate (as CaCO3), Total (mg/L)	**405**	**64.2**	**380**	**318**	NA	NA	NA
Bromide, Total (mg/L)	**1.83**	**9.39**	**6.06**	**4.78**	NA	NA	NA
Calcium Carbonate, Total (mg/L)	**405**	**64.2**	**380**	**318**	NA	NA	NA
Chemical Oxygen Demand (COD), Total (mg/L)	**47**	**250**	**370**	**64**	NA	NA	NA
Chloride, Total (mg/L)	**838**	**3250**	**4190**	**859**	NA	NA	NA
Nitrate (as N), Total (mg/L)	ND (0.05)	**0.537**	**0.166**	ND (0.05)	10	10	100
Nitrite (as N), Total (mg/L)	ND (0.05)	**0.057**	ND (0.05)	**0.05**	1	1	100
Sulfate, Total (mg/L)	**26.8**	ND (1)	**24.7**	**1.07**	NA	NA	NA
Total Organic Carbon (TOC) (mg/L)	**3.31**	**4.14**	**3.62**	**4.53**	NA	NA	NA
Herbicides (ug/L)							
2-(2-Methyl-4-chlorophenoxy)-propionic acid (MCPP)	ND (500)	ND (500)	ND (500)	ND (500)	NA	NA	16000
2,4,5-T	ND (2)	ND (2)	ND (2)	ND (2)	70	NA	100000
2,4,5-TP (Silvex)	ND (2)	ND (2)	ND (2)	ND (2)	60	50	8400
2,4-DB	ND (10)	ND (10)	ND (10)	ND (10)	NA	NA	NA
2,4-Dichlorophenoxyacetic acid (2,4-D)	ND (10)	ND (10)	ND (10)	ND (10)	70	70	NA
2-Methyl-4-chlorophenoxyacetic acid (MCPA)	ND (63.2) [A]	ND (63.2) [A]	ND (63.2) [A]	ND (63.2) [A]	4	NA	680
2-sec-butyl-4,6-dinitrophenol (Dinoseb)	ND (5)	ND (5)	ND (5)	ND (5)	7	7	1200
Dalapon	ND (20)	ND (20)	ND (20)	ND (20)	200	200	100000
Dicamba	ND (1)	ND (1)	ND (1)	ND (1)	200	NA	NA
Dichloroprop	ND (10)	ND (10)	ND (10)	ND (10)	NA	NA	NA
Pesticides (ug/L)							
4,4'-DDD	ND (0.029)	ND (0.029)	ND (0.029)	ND (0.029)	1	NA	1.7
4,4'-DDE	ND (0.029)	ND (0.029)	ND (0.029)	ND (0.029)	1	NA	140
4,4'-DDT	ND (0.029)	ND (0.029)	ND (0.029)	ND (0.029)	1	NA	19000
Aldrin	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.014)	0.02	NA	2.9
alpha-BHC	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.014)	0.06	NA	80
alpha-Chlordane	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.014)	NA	NA	NA
beta-BHC	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.014)	0.2	NA	280
Chlordane	ND (0.143)	ND (0.143)	ND (0.143)	ND (0.143)	NA	NA	NA
delta-BHC	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.014)	NA	NA	NA
Dieldrin	ND (0.003)	ND (0.003)	ND (0.003)	ND (0.003)	0.02	NA	13
Endosulfan I	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.014)	NA	NA	NA
Endosulfan II	ND (0.029)	ND (0.029)	ND (0.029)	ND (0.029)	NA	NA	NA
Endosulfan sulfate	ND (0.029)	ND (0.029)	ND (0.029)	ND (0.029)	NA	NA	NA
Endrin	ND (0.029)	ND (0.029)	ND (0.029)	ND (0.029)	2	2	87
Endrin aldehyde	ND (0.029)	ND (0.029)	ND (0.029)	ND (0.029)	NA	NA	NA
Endrin ketone	ND (0.029)	ND (0.029)	ND (0.029)	ND (0.029)	NA	NA	NA
gamma-BHC (Lindane)	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.014)	0.03	0.2	7.2
gamma-Chlordane	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.014)	NA	NA	NA
Heptachlor	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.014)	0.07	0.4	3.9
Heptachlor epoxide	ND (0.014)	ND (0.014)	ND (0.014)	ND (0.014)	0.04	0.2	5.5
Methoxychlor	ND (0.143)	ND (0.143)	ND (0.143)	ND (0.143)	40	40	1400
Toxaphene	ND (0.143)	ND (0.143)	ND (0.143)	ND (0.143)	0.3	3	NA

TABLE III
Summary of Groundwater Analytical Results
Machias Landfill Investigation
Machias Dike Bridge
MaineDOT WIN 16714.00
Machias, Maine

Location Name	Aug-22				MEGs for Drinking Water	Maximum Contaminant Level (MCLs)	Construction Worker Groundwater RAGs
	HA22-2(OW)	HA22-8(OW)	HA22-9(OW)	HA22-10(OW)			
Lab Sample ID	L2244025-01 L2244025-05	L2244025-02 L2244025-06	L2244025-03 L2244025-07	L2244025-04 L2244025-08			
PFAS (ng/L)							
4,8-Dioxa-3H-Perfluorononanoic Acid (ADONA)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	**3.29**	**3.46**	**5.39**	**5.49**	NA	NA	NA
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND (1.83)	ND (1.87)	ND (1.86)	**4.75**	NA	NA	NA
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
Perfluoro-2-propoxypropanoic acid (PFPrOPrA)(GenX) (HFPO-DA)	ND (45.7)	ND (46.7)	ND (46.4)	ND (46.1)	NA	NA	NA
Perfluorobutanesulfonic acid (PFBS)	**2.67**	ND (1.87)	**3.24**	**2.01**	NA	NA	1.00E+08
Perfluorobutanoic acid (PFBA)	**9.19**	ND (1.87)	**16.1**	**6.28**	NA	NA	NA
Perfluorodecanesulfonic acid (PFDS)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
Perfluorodecanoic acid (PFDA)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
Perfluorododecanoic acid (PFDoDA)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
Perfluoroheptanesulfonic acid (PFHpS)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
Perfluoroheptanoic acid (PFHpA)	**22.5** [D]	ND (1.87)	**26.2** [D]	**14.5**	NA	NA	NA
Perfluorohexadecanoic acid (PFHxDA)	ND (3.66)	ND (3.74)	ND (3.71)	ND (3.69)	NA	NA	NA
Perfluorohexanesulfonic acid (PFHxS)	**26.8** [D]	**16.3**	**28.9** [D]	**19.1**	NA	NA	NA
Perfluorohexanoic acid (PFHxA)	**23.1**	ND (1.87)	**33**	**13.9**	NA	NA	NA
Perfluorononane sulfonic acid (PFNS)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
Perfluorononanoic acid (PFNA)	**3.57**	ND (1.87)	ND (1.86)	**4.6**	NA	NA	NA
Perfluorooctadecanoic acid (PFOcDA)	ND (3.66)	ND (3.74)	ND (3.71)	ND (3.69)	NA	NA	NA
Perfluorooctane sulfonamide (PFOSA)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
Perfluorooctanesulfonic acid (PFOS)	**35.7** [D]	**8.02**	**8.27**	**72** [AD]	70	NA	750000
Perfluorooctanoic acid (PFOA)	**84** [AD]	**2.18**	**59.9** [D]	**71.2** [AD]	70	NA	750000
Perfluoropentanesulfonic acid (PFPeS)	**2.17**	ND (1.87)	**2.24**	ND (1.84)	NA	NA	NA
Perfluoropentanoic acid (PFPeA)	**13.3**	ND (1.87)	**16.7**	**8.83**	NA	NA	NA
Perfluorotetradecanoic acid (PFTeDA)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
Perfluorotridecanoic acid (PFTrDA)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
Perfluoroundecanoic acid (PFUnDA)	ND (1.83)	ND (1.87)	ND (1.86)	ND (1.84)	NA	NA	NA
Total PFAS (6): PFOA, PFOS, PFNA, PFHxS, PFHpA, PFDA	**173** [D]	**26.5** [D]	**123** [D]	**181** [D]	NA	NA	NA

ABBREVIATIONS AND NOTES:
NA: Not Applicable
ND (2.5): Not detected, number in parentheses is the method detection limit
MEGs: Maximum Exposure Guidelines
RAGs: Maine Remedial Action Guidelines
ug/L: microgram per liter
-: Not Analyzed

- Volatile Organic analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Highlighted values indicate an exceedances of at least one of the listed screening levels.
  A - Maximum Exposure Guidelines for Drinking Water, 2016
  B - Maximum Contaminant Level (MCLs)
  C - Construction Worker Groundwater ME RAGs, May 2021
  D - Maine Center for Disease Control interim drinking water standard of 20 ng/L (alone or in combination) for the six regulated PFAS contaminants that include PFOA, PFAS, PFHxS, PFNA, PFHpA, and PFDA.

	Individual	Date
Prepared By:	KJC	9/8/2022
Checked By:	DAD	9/8/2022
Reviewed By:	EAF	10/20/2022

FIGURES

MAP SOURCE: ESRI
SITE COORDINATES: 44°43'22"N, 67°28'07"W

HALEY ALDRICH

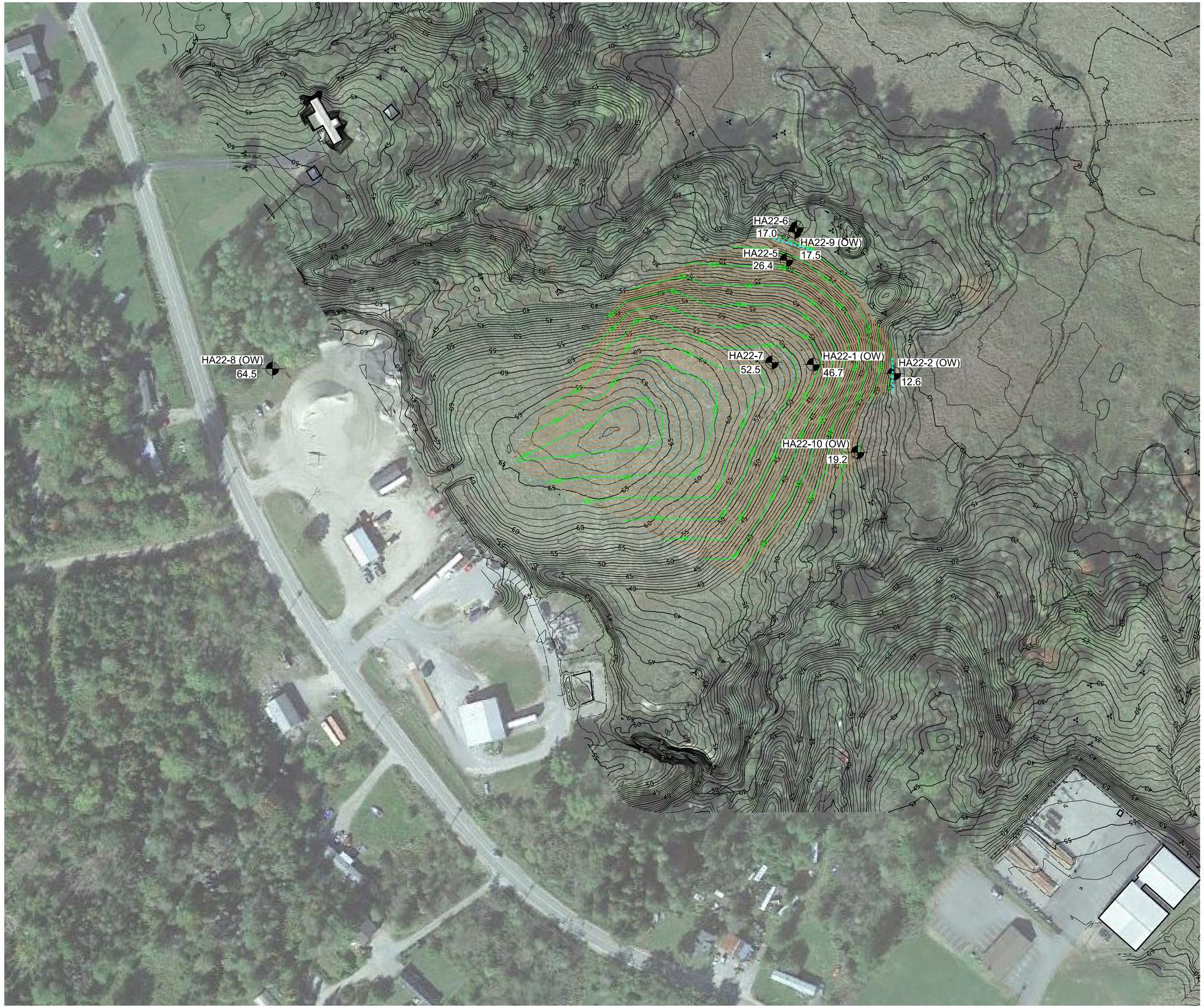
MACHIAS LANDFILL INVESTIGATION
MACHIAS DIKE BRIDGE
MAINEDOT WIN 16714.00
MACHIAS, MAINE

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
NOVEMBER 2022

FIGURE 1

GIS: \\haleyaldrich.com\share\POR_common\PROJECTS\130749 - 2017 MEDOT Env. Multi-PING\GIS\130749_MACHIAS_LANDFILL\130749_MACHIAS_LANDFILL.aprx - khaskins - 10/19/2022 12:01 PM



LEGEND

HA22-1 / 46.7 — DESIGNATION, AS-DRILLED LOCATION AND GROUND SURFACE ELEVATION OF BORING DRILLED BY NEW ENGLAND BORING CONTRACTORS OF HERMON, MAINE (HA22-1 THROUGH HA22-7) AND S.W. COLE ENGINEERING OF GRAY, MAINE (HA22-8 THROUGH HA22-10) UNDER THE DIRECTION OF HALEY & ALDRICH IN JUNE AND JULY 2022

(OW) — DESIGNATES WELL INSTALLED IN COMPLETED BOREHOLE

55 — EXISTING GROUND SURFACE ELEVATION CONTOUR BASED ON LIDAR SURVEY

60 — EXISTING GROUND SURFACE ELEVATION CONTOUR BASED ON SURVEY PERFORMED BY MAINE DEPARTMENT OF TRANSPORTATION (5-FT INTERVAL)

EXISTING GROUND SURFACE ELEVATION CONTOUR BASED ON SURVEY PERFORMED BY MAINE DEPARTMENT OF TRANSPORTATION (1-FT. INTERVAL)

APPROXIMATE LOCATION OF EDGE OF LANDFILL WASTE/ COVER BASED ON TEST BORING INFORMATION

NOTES:

1. EXISTING SITE CONDITIONS AND TOPOGRAPHY ARE TAKEN FROM ELECTRONIC MICROSTATION FILES PROVIDED BY STANTEC CONSULTING SERVICES INC. ON 12 SEPTEMBER 2022.
2. THE PLAN LOCATIONS OF AND GROUND SURFACE ELEVATIONS AT TEST BORINGS SHOWN WERE DETERMINED UPON THE COMPLETION OF DRILLING BY THE MAINE DEPARTMENT OF TRANSPORTATION USING GPS SURVEY EQUIPMENT.
3. ELEVATIONS ARE IN FEET AND REFERENCE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
4. HORIZONTALL DATUM: MAINE 2000 EAST NAD 83 (FT).
5. TEST BORINGS WERE MONITORED IN THE FIELD BY A HALEY & ALDRICH, INC. GEOLOGIST.
6. REFER TO APPENDIX A FOR TEST BORING LOGS AND ROCK CORE PHOTOGRAPHS AND APPENDIX B FOR OBSERVATION WELL INSTALLATION AND GROUNDWATER MONITORING REPORTS.
7. BACKGROUND IMAGE TAKEN FROM GOOGLE EARTH PRO DATED 28 SEPTEMBER 2019.
8. TEST BORING HA22-3 AND HA22-4 WERE LAID OUT IN THE FIELD AS ALTERNATE BORING LOCATIONS, TO BE DRILLED DEPENDING ON CONDITIONS ENCOUNTERED AND AVAILABLE TIME. THESE TWO BORINGS WERE NOT DRILLED.

N

0 75 150

HALEY ALDRICH

MACHIAS LANDFILL INVESTIGATION
MACHIAS DIKE BRIDGE
MAINEDOT WIN 16714.00
MACHIAS, MAINE

SITE AND SUBSURFACE EXPLORATION LOCATION PLAN

SCALE: AS SHOWN
NOVEMBER 2022

FIGURE 2

Saved by: KPOSTOLOWSKI Printed: ---- Sheet: MODEL
Z:\POR_COMMON\PROJECTS\130749 - 2017 MEDOT ENV. MULTI-PIN\CAD\130749_001_BORING PLAN.DGN

APPENDIX A
Test Boring Logs and Rock Core Photographs

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-1
WIN: 16714.00

Driller:	New England Boring Co., Inc.	**Elevation (ft.)**	46.7	**Auger ID/OD:**	
Operator:	T. Schaeffer	**Datum:**	NAVD 88	**Sampler:**	Split-Spoon 3.0 in. ID
Logged By:	H. Hollauer	**Rig Type:**	B53 Mobile Drill	**Hammer Wt./Fall:**	SS-140#/30;HW-300#/16
Date Start/Finish:	6-29-2022/6-29-2022	**Drilling Method:**	SSA/HW Drive	**Core Barrel:**	NQ-2.0 in. ID
Boring Location:	N324629; E2402438	**Casing ID/OD:**	HW-4.0 in. ID/NW-3.0 in. ID	**Water Level*:**	29.7 ft
Hammer Efficiency Factor:	0.863	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/12	0.0 - 2.0	3/8/8/7	16	23				Brown, slightly moist, very stiff, Silty CLAY, trace coarse gravel -CLAY CAP-(CL) PID Readings=Not Detected MgM=CH4=OK	
	2D	24/10	2.0 - 4.0	3/7/2/29	9	13				Similar to above, except stiff, cobble pieces -CLAY CAP-(CL) PID Readings=Not Detected MgM=CH4=2.6	
								42.7		4.0 Cobble layer from 4 to 5 ft	
5	3D	24/16	5.0 - 7.0	40/57/8/10	65	93		41.7		5.0 Dark grey, slightly moist, hard, Silty CLAY, trace fine to coarse sand, trace gravel, cobble pieces, approximately 30% waste of newspaper, trash plastic bag, fine plastic netting -LANDFILL WASTE AND COVER-(CL) PID Readings=Not Detected MgM=CH4=0.2 Note: Driller moved rig approximately 3 ft to avoid obstruction at approximately 6 ft.	
								40.7		6.0 **Bottom of Exploration at 6.0 feet below ground surface.** Note: Boring moved approximately 3 ft to avoid obstruction at approximately 6 ft depth. See Test Boring Report HA22-1B for soil description of continued boring.	
10											
15											
20											
25											

Remarks:

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Boring No.: HA22-1

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-1B(OW)
WIN: 16714.00

Driller:	New England Boring Co., Inc.	**Elevation (ft.)**	46.7	**Auger ID/OD:**	
Operator:	T. Schaeffer	**Datum:**	NAVD 88	**Sampler:**	Split-Spoon 3.0 in. ID
Logged By:	H. Hollauer	**Rig Type:**	B53 Mobile Drill	**Hammer Wt./Fall:**	SS-140#/30;HW-300#/16
Date Start/Finish:	6-29-2022/6-30-2022	**Drilling Method:**	SSA/HW/NW Drive	**Core Barrel:**	NQ-2.0 in. ID
Boring Location:	N324629; E2402438	**Casing ID/OD:**	HW-4.0 in. ID/NW-3.0 in. ID	**Water Level*:**	29.7 ft
Hammer Efficiency Factor:	0.863	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0										Driller moved rig approximately 3 ft to avoid obstruction at approximately 6 ft depth at boring location HA22-1. See Test Boring Report HA22-1 for soil description for 0 to 6 ft depth.	
5											
	4D	24/12	6.0 - 8.0	4/3/4/5	7	10		40.7		6.0 Dark grey, slightly moist, stiff, Silty CLAY, trace sand, some cobble pieces -LANDFILL WASTE AND COVER-(CL) PID Readings=Not Detected MgM=OK	
	5D	24/12	8.0 - 10.0	4/3/4/5	7	10				Similar to 4D, except trace gravel, approximately 0.5-in. thick layer of black ash, approximately 30% waste of newspaper, wood, plastic bags, glass, metal -LANDFILL WASTE AND COVER-(CL)	
10								36.7		10.0 Grey, moist, very dense, granitic piece of COBBLE, trace metal, rag, poor recovery, waste approximately 20% -LANDFILL WASTE AND COVER-(CL)	
	6D	24/3	10.0 - 12.0	19/34/60/35	94	135		34.7		12.0 Grey, wet, very dense, fine to coarse SAND, little silt, trace gravel, poorly-graded, approximately 40% waste of newspaper, plastic bags, approximately 3-in. black ash layer beneath waste -LANDFILL WASTE AND COVER-(SP)	
	7D	24/12	12.0 - 14.0	11/19/22/14	41	59		32.7		14.0 Brown, wet, loose, fine to coarse SAND, trace silt, well-graded, washed soil -LANDFILL WASTE AND COVER-(SW)	
	8D	24/4	14.0 - 16.0	8/4/2/2	6	9					
15											
	9D	24/3	16.0 - 18.0	2/3/6/8	9	13				Similar to 8D, except medium dense and trace glass, plastic -LANDFILL WASTE AND COVER-(SW)	
	10D	24/8	18.0 - 20.0	5/3/3/2	6	9		28.4		Dark brown, wet, loose, fine to coarse SAND, trace silt, well-graded, trace glass (approximately 10%) -LANDFILL WASTE AND COVER-(SW-SM)	
										18.3	
20								26.7		Dark grey, wet, loose, Silty SAND	
	11D	24/14	20.0 - 22.0	20/42/42/46	84	121		26.4		-LANDFILL WASTE AND COVER-(SM)	
										20.0 Grey, slightly moist, hard, Silty CLAY, trace nail -LANDFILL WASTE AND COVER-(CL)	
	12D	24/20	22.0 - 24.0	9/20/22/24	42	60				20.3 Brown and grey mottled, slightly moist, hard, Silty CLAY -MARINE DEPOSIT-(REWORKED) (CL)	
										Similar to 11D -MARINE DEPOSIT-(REWORKED) (CL)	
25	13D	24/22	24.0 - 26.0	9/10/14/14	24	35				Brown and grey mottled, slightly moist, hard, Silty CLAY -MARINE DEPOSIT-(REWORKED) (CL)	

Remarks:

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Boring No.: HA22-1B(OW)

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-1B(OW)
WIN: 16714.00

Driller:	New England Boring Co., Inc.	**Elevation (ft.)**	46.7	**Auger ID/OD:**	
Operator:	T. Schaeffer	**Datum:**	NAVD 88	**Sampler:**	Split-Spoon 3.0 in. ID
Logged By:	H. Hollauer	**Rig Type:**	B53 Mobile Drill	**Hammer Wt./Fall:**	SS-140#/30;HW-300#/16
Date Start/Finish:	6-29-2022/6-30-2022	**Drilling Method:**	SSA/HW/NW Drive	**Core Barrel:**	NQ-2.0 in. ID
Boring Location:	N324629; E2402438	**Casing ID/OD:**	HW-4.0 in. ID/NW-3.0 in. ID	**Water Level*:**	29.7 ft
Hammer Efficiency Factor: 0.863		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
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U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140 lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25											
	14D	24/24	26.0 - 28.0	13/15/16/20	31	45				Similar to 13D -MARINE DEPOSIT-(REWORKED) (CL)	
	15D	24/24	28.0 - 30.0	6/8/12/14	20	29		18.2		Similar to 13D, except very stiff -MARINE DEPOSIT-(REWORKED) (CL)	
										28.5 Grey-brown,slightly moist, very stiff, Silty CLAY -MARINE DEPOSIT-(REWORKED) (CL)	
30	16D	24/24	30.0 - 32.0	5/9/10/12	19	27				Grey-brown, slightly moist, very stiff, Silty CLAY -MARINE DEPOSIT-(REWORKED) (CL)	
								15.2		31.5 Grey, slightly moist, very stiff, Silty CLAY, layered depositional structure -MARINE DEPOSIT-(CL)	
								12.1		34.6 Grey-brown, slightly moist, very dense, fine to coarse SAND, trace silt, little gravel, loosely bonded -GLACIAL TILL-(SP)	
35	17D	24/20	35.0 - 37.0	20/20/27/29	47	68					
							RC	8.7		38.0 COBBLES	
	R1	60/51	39.0 - 44.0	RQD = 85%			NQ Core	8.0		38.7 Top of Bedrock El. 8.0 Note: Advanced roller bit to 39.0 ft and begin NQ rock core. R1: Dark grey, porphyritic BASALT with occasional 1-in. thick clasts, very hard, fresh, massive, solid core stem. Rock Quality=Good -DENNYS FORMATION- Recovery=85% R1 Core Times (min:sec): 39.0-40.0' (3:30); 40.0-41.0' (3:00); 41.0-42.0' (2:30); 42.0-43.0' (2:00); 43.0-44.0' (2:30)	
40								2.7		44.0 **Bottom of Exploration at 44.0 feet below ground surface.** Note: Installed Observation Well. See Observation Well Report HA22-1(OW) for details.	
45											
50											

Remarks:

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-2(OW)
WIN: 16714.00

Driller:	New England Boring Co., Inc.	**Elevation (ft.)**	12.6	**Auger ID/OD:**	
Operator:	T. Schaeffer	**Datum:**	NAVD 88	**Sampler:**	Split-Spoon 3.0 in. ID
Logged By:	H. Hollauer	**Rig Type:**	B53 Mobile Drill	**Hammer Wt./Fall:**	SS-140#/30;HW-300#/16
Date Start/Finish:	6-27-2022/6-28-2022	**Drilling Method:**	SSA/HW Drive	**Core Barrel:**	NQ-2.0 in. ID
Boring Location:	N324616; E2402555	**Casing ID/OD:**	HW-4.0 in. ID/NW-3.0 in. ID	**Water Level*:**	3.6 ft
Hammer Efficiency Factor:	0.863	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/18	0.0 - 2.0	2/2/5/8	7	10				Brown grading to grey-brown, slightly moist, stiff, Silty CLAY, reworked -CLAY CAP-(CL) PID Readings=1.7 ppm MgM=OK	
								10.6		2.0	
	2D	24/20	2.0 - 4.0	2/7/8/11	15	22				Grey-brown, slightly moist, very stiff, Silty CLAY, layered depositional structure -MARINE DEPOSIT-(CL) PID Reading=1.0 ppm MgM=OK	
	3D	24/20	4.0 - 6.0	4/7/9/10	16	23					WC=30 LL=45 PL=23 PI=22 CL
5										Grey-brown mottled, slightly moist to moist, very stiff, Silty CLAY, fissures of wet grey clay -MARINE DEPOSIT-(CL) PID Readings=0.7 ppm MgM=OK	
	4D	24/22	6.0 - 8.0	4/6/9/12	15	22					
										Grey-brown, slightly moist, very stiff, Silty CLAY, layered depositional structure, occasional fine sand partings -MARINE DEPOSIT-(CL) PID Readings=0.2 ppm MgM=OK Note: Advanced NW 3-in. casing to 9.0 ft.	
								3.6		9.0	
10							RC			Top of Bedrock El. 3.6 Note: Advanced roller bit to 10.0 ft and begin NQ rock coring.	
	R1	20/18	10.3 - 12.0	RQD = 70%			NQ Core			R1: Dark grey, porphyritic BASALT, very hard to hard, fresh to slightly weathered. Primary joints dipping horizontally, spaced moderately close, open. Joint surfaces moderately weathered with iron staining. Joint infilled with approximately 0.5 in. grey fine to coarse silty sand. Secondary joints dipping at moderate angles, smooth, planar. Rock Quality=Fair -DENNYS FORMATION- Recovery=90% R1 Core Times (min:sec): 10.3-11.0' (5:00); 11.0-12.0' (4:00)	
	R2	39.6/23	12.0 - 15.3	RQD = 43%						R2: Similar to R1. Rock Quality=Poor -DENNYS FORMATION- Recovery=58% R2 Core Times (min:sec): 12.0-13.0' (4:00); 13.0-14.0' (3:00); 14.0-15.3' (4:00)	
15								-2.7		15.3	
										Bottom of Exploration at 15.3 feet below ground surface.	
20										Note: Installed Observation Well. See Observation Well Report HA22-2(OW) for details.	
25											

Remarks:

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Boring No.: HA22-2(OW)

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-5
WIN: 16714.00

Driller:	New England Boring Co., Inc.	**Elevation (ft.)**	26.4	**Auger ID/OD:**	
Operator:	T. Schaeffer	**Datum:**	NAVD 88	**Sampler:**	Split-Spoon 1.375 in. ID
Logged By:	H. Hollauer	**Rig Type:**	B53 Mobile Drill	**Hammer Wt./Fall:**	SS-140#/30;HW-300#/16
Date Start/Finish:	6-28-2022/6-29-2022	**Drilling Method:**	SSA/HW Drive	**Core Barrel:**	NQ-2.0 in. ID
Boring Location:	N324780; E2402399	**Casing ID/OD:**	HW-4.0 in. ID/NW-3.0 in. ID	**Water Level*:**	--
Hammer Efficiency Factor:	0.863	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
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V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/18	0.0 - 2.0	1/3/4/3	7	10				Grey and brown, slightly moist, stiff, Silty CLAY, poorly-graded sand layer approximately 0.5-in. thick, no odor -CLAY CAP-(CL) PID Readings=7.8 ppm MgM=OK	
								24.4		2.0	
	2D	24/16	2.0 - 4.0	2/2/3/3	5	7				Grey, moist, medium stiff, Silty CLAY, few 0.5-in. thick sand layers, trace ash seam, few layers of plastic sheeting, septic-like odor -LANDFILL WASTE-(CL) PID Readings=0.8 ppm MgM=OK	
	3D	24/6	4.0 - 6.0	1/2/2/2	4	6					
5											
	4D	24/16	6.0 - 8.0	1/2/6/6	8	12				Similar to 2D, except wet, trace fine sand, thin seam of blue plastic sheeting, thin seam of newspaper, few sand seams approximately 0.5-in. spaced approximately 3 to 4 in. -LANDFILL WASTE-(CL) PID Readings=0.2 ppm MgM=0.8 CH4	
								18.7			
	5D	24/20	8.0 - 10.0	4/7/9/11	16	23				Grey, wet, stiff, Silty CLAY, few black ash layers, trace metal, glass pieces, plastic sheeting, insulation pieces, no odor -LANDFILL WASTE-(CL) PID Readings=0.0 ppm MgM=1.1 CH4	
10	6D	24/20	10.0 - 12.0	3/7/8/11	15	22				7.7	
										Brown, slightly moist, stiff, Silty CLAY, layered depositional structure -MARINE DEPOSIT-(CL) Grey-brown mottled, slightly moist, very stiff, Silty CLAY, layered depositional structure -MARINE DEPOSIT-(CL) Similar to 5D -MARINE DEPOSIT-(CL)	
15	7D	24/24	15.0 - 17.0	3/4/5/7	9	13				Grey-brown, slightly moist, stiff, Silty CLAY -MARINE DEPOSIT-(CL)	
20	8D	24/24	20.0 - 22.0	WOH/WOH/3/3	3	4				Grey, slightly moist, medium stiff, Silty CLAY -MARINE DEPOSIT-(CL)	WC=29 LL=38 PL=20 PI=18 CL
								2.7		23.7	
25								1.9		Note: Drilling change noted while advancing casing. Casing refusal at 24.8 ft.	

Remarks:

3.0-in. diameter split-spoon used to sample 1D to 6D.

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Boring No.: HA22-5

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-5
WIN: 16714.00

Driller:	New England Boring Co., Inc.	**Elevation (ft.)**	26.4	**Auger ID/OD:**	
Operator:	T. Schaeffer	**Datum:**	NAVD 88	**Sampler:**	Split-Spoon 1.375 in. ID
Logged By:	H. Hollauer	**Rig Type:**	B53 Mobile Drill	**Hammer Wt./Fall:**	SS-140#/30;HW-300#/16
Date Start/Finish:	6-28-2022/6-29-2022	**Drilling Method:**	SSA/HW Drive	**Core Barrel:**	NQ-2.0 in. ID
Boring Location:	N324780; E2402399	**Casing ID/OD:**	HW-4.0 in. ID/NW-3.0 in. ID	**Water Level*:**	--
Hammer Efficiency Factor: 0.863		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
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V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140 lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
										24.5	
										Cobbles	
								0.4		26.0	
	9D	24/12	26.0 - 28.0	16/10/11/11	21	30				Grey, wet, medium dense, fine to coarse SAND, little silt, trace gravel, poorly-graded, one silt laminae -FLUVIAL DEPOSIT-(SM)	
								-2.4		Note: Rollerbit to 28.8 ft and cored from 28.8 to 30.5 ft.	
										28.8	
										Boulder and Cobbles	
30	10D	12/6	30.5 - 31.5	20/30				-4.1		30.5	
							RC	-5.1		Grey-brown, wet, dense to very dense, fine to coarse SAND, trace silt, little gravel, well-graded, loosely bonded -GLACIAL TILL-(SW)	
	R1	60/57	32.5 - 37.5	RQD = 78%			~~NQ~~			31.5	
							Core			Top of Bedrock El. -5.1 Note: Advance roller bit to 32.5 ft and begin NQ rock coring. R1: Dark grey, white, aphanitic to coarse-grained, basaltic TUFF-BRECCIA, very hard to hard, slightly weathered. Primary joints dipping at horizontal to low angles, spaced very close to moderately close, open. No infilling. Joint surfaces slightly iron-stained, calcite coatings. Rock Mass=Good -DENNYS FORMATION- Recovery=95% R1 Core Times (min:sec): 32.5-33.5' (3:00); 33.5-34.5' (2:00); 34.5-35.5' (3:00); 35.5-36.5' (3:00); 36.5-37.5' (2:00)	
35								-11.1		37.5	
										Bottom of Exploration at 37.5 feet below ground surface.	
40											
45											
50											

Remarks:

3.0-in. diameter split-spoon used to sample 1D to 6D.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

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Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-6
WIN: 16714.00

Driller:	New England Boring Co., Inc.	**Elevation (ft.)**	17.0	**Auger ID/OD:**	--
Operator:	T. Schaeffer	**Datum:**	NAVD 88	**Sampler:**	Split-Spoon 3.0 in. ID
Logged By:	H. Hollauer	**Rig Type:**	B53 Mobile Drill	**Hammer Wt./Fall:**	SS-140#/30
Date Start/Finish:	6-29-2022/6-29-2022	**Drilling Method:**	SSA Drive	**Core Barrel:**	--
Boring Location:	N324827; E2402414	**Casing ID/OD:**	--	**Water Level*:**	--
Hammer Efficiency Factor:	0.863	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0	1D	24/18	0.0 - 2.0	WOH/2/2/7	4	6		16.0		Grey and brown, slightly moist, medium stiff, silty CLAY, trace plastic bag, reworked structure to approximately 1 ft -CLAY CAP-(CL)	
										1.0	
	2D	24/22	2.0 - 4.0	10/23/36/38	59	85				Grey-brown mottled, slightly moist, hard, Silty CLAY, layered depositional structure -MARINE DEPOSIT-(CL)	
	3D	24/24	4.0 - 6.0	7/10/11/13	21	30				Similar to 2D, except very stiff	WC=26 LL=40 PL=22 PI=18 CL
5								11.0		6.0	
										Bottom of Exploration at 6.0 feet below ground surface.	
										No Refusal	
10											
15											
20											
25											

Remarks:

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Boring No.: HA22-6

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-7
WIN: 16714.00

Driller:	New England Boring Co., Inc.	**Elevation (ft.)**	52.5	**Auger ID/OD:**	--
Operator:	T. Schaeffer	**Datum:**	NAVD 88	**Sampler:**	Split-Spoon 1.375 in. ID
Logged By:	H. Hollauer	**Rig Type:**	B53 Mobile Drill	**Hammer Wt./Fall:**	SS-140#/30
Date Start/Finish:	7-01-2022/7-01-2022	**Drilling Method:**	SSA/HW Drive	**Core Barrel:**	--
Boring Location:	N324632; E2402378	**Casing ID/OD:**	HW-4.0 in. ID	**Water Level*:**	--
Hammer Efficiency Factor:	0.863	**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

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MD = Unsuccessful Split Spoon Sample Attempt
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V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0											
5											
10	1D	24/14	10.0 - 12.0	2/2/3/4	5	7				Grey-brown, slightly moist, medium stiff, silty CLAY, trace fine sand, trace gravel, approximately 10% waste of plastic bags -LANDFILL WASTE AND COVER-(CL)	
15											
20	2D	24/10	20.0 - 22.0	6/4/4/4	8	12				Grey, wet, stiff, Silty CLAY, trace fine to coarse sand, trace gravel, approximately 30% waste of plastic, glass and wire -LANDFILL WASTE AND COVER-(CL)	
								30.5		22.0	
	3D	24/16	22.0 - 24.0	17/30/37/44	67	96				Brown, slightly moist, hard, Silty CLAY, reworked -MARINE DEPOSIT (REWORKED)-(CL)	
25											

Remarks:

3.0-in. diameter split-spoon used to sample 1D.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Boring No.: HA22-7

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-7
WIN: 16714.00

Driller:	New England Boring Co., Inc.	**Elevation (ft.)**	52.5	**Auger ID/OD:**	--
Operator:	T. Schaeffer	**Datum:**	NAVD 88	**Sampler:**	Split-Spoon 1.375 in. ID
Logged By:	H. Hollauer	**Rig Type:**	B53 Mobile Drill	**Hammer Wt./Fall:**	SS-140#/30
Date Start/Finish:	7-01-2022/7-01-2022	**Drilling Method:**	SSA/HW Drive	**Core Barrel:**	--
Boring Location:	N324632; E2402378	**Casing ID/OD:**	HW-4.0 in. ID	**Water Level*:**	--
Hammer Efficiency Factor: 0.863		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140 lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
25										Note: Probe advanced to bottom of clay/glacial till interface.	
30											
35								17.5		Note: Drill action indicates cobbles and gravel at 35.0 ft.	
								16.9		-PROBABLE GLACIAL TILL- (35.0 – 35.6)	
40										**Bottom of Exploration at 35.6 feet below ground surface.**	
45											
50											

Remarks:

3.0-in. diameter split-spoon used to sample 1D.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-8(OW)

WIN: 16714.00

Driller:	S.W. Cole Explorations, LLC	**Elevation (ft.)**	64.5	**Auger ID/OD:**	--
Operator:	K. Hanscom	**Datum:**	NAVD 88	**Sampler:**	--
Logged By:	H. Hollauer	**Rig Type:**	Diedrich 50 Track	**Hammer Wt./Fall:**	HW-300#/16
Date Start/Finish:	7-25-2022/7-25-2022	**Drilling Method:**	SSA/HW Drive	**Core Barrel:**	--
Boring Location:	N324623; E2401655	**Casing ID/OD:**	HW-4.0 in. ID	**Water Level*:**	5.4 ft
Hammer Efficiency Factor:		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0								60.5		Note: No soil samples collected. SSA used to determine refusal depth and approximate depth to water. Soil descriptions determined from drill cutting observations. Brown, dry, Silty fine to medium SAND, trace coarse sand, trace coarse gravel -FILL-(SM)	
										4.0 Brown grading to grey, moist, Silty CLAY -MARINE DEPOSIT-(CL)	
5											
10											
15								46.9		Auger refusal at 17.6 ft 17.6 **Bottom of Exploration at 17.6 feet below ground surface.** Note: Installed observation well - see Observation Well Installation Report HA22-8(OW) for details.	
20											
25											

Remarks:

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Boring No.: HA22-8(OW)

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-9(OW)
WIN: 16714.00

Driller:	S.W. Cole Explorations, LLC	**Elevation (ft.)**	17.5	**Auger ID/OD:**	--
Operator:	K. Hanscom	**Datum:**	NAVD 88	**Sampler:**	--
Logged By:	H. Hollauer	**Rig Type:**	Diedrich 50 Track	**Hammer Wt./Fall:**	HW-300#/16
Date Start/Finish:	7-25-2022/7-25-2022	**Drilling Method:**	SSA/HW Drive	**Core Barrel:**	--
Boring Location:	N324821; E2402411	**Casing ID/OD:**	HW-4.0 in. ID	**Water Level*:**	20.8 ft
Hammer Efficiency Factor:		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0										Note: No soil samples collected. SSA used to determine refusal depth and approximate depth to water. Soil descriptions determined from drill cutting observations.	
										Brown grading to grey, slightly moist, Silty CLAY, trace fine sand -MARINE DEPOSIT-(CL)	
5											
10											
15											
20											
								-3.8		21.3	
								-3.9		Grey, Silty CLAY, trace medium sand in wash water at 21.3 ft -MARINE DEPOSIT-(CL) Casing refusal at 21.4 ft	
										21.4	
										Bottom of Exploration at 21.4 feet below ground surface.	
25										Note: Installed observation well - see Observation Well Installation Report HA22-9(OW) for details.	

Remarks:

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Boring No.: HA22-9(OW)

Maine Department of Transportation

Soil/Rock Exploration Log
US CUSTOMARY UNITS

Project: Machias Landfill
Machias Dike Bridge
Location: Machias, Maine

Boring No.: HA22-10(OW)
WIN: 16714.00

Driller:	S.W. Cole Explorations, LLC	**Elevation (ft.)**	19.2	**Auger ID/OD:**	--
Operator:	K. Hanscom	**Datum:**	NAVD 88	**Sampler:**	Split-Spoon 1.375 in. ID
Logged By:	H. Hollauer	**Rig Type:**	Diedrich 50 Track	**Hammer Wt./Fall:**	SS-140#/30
Date Start/Finish:	7-26-2022/7-26-2022	**Drilling Method:**	SSA/HW Drive	**Core Barrel:**	--
Boring Location:	N324502; E2402502	**Casing ID/OD:**	HW-4.0 in. ID	**Water Level*:**	4.9 ft
Hammer Efficiency Factor: 0.91		**Hammer Type:**	Automatic ☒ Hydraulic ☐ Rope & Cathead ☐		

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample Attempt
U = Thin Wall Tube Sample
MU = Unsuccessful Thin Wall Tube Sample Attempt
V = Field Vane Shear Test, PP = Pocket Penetrometer
MV = Unsuccessful Field Vane Shear Test Attempt
R = Rock Core Sample
SSA = Solid Stem Auger
HSA = Hollow Stem Auger
RC = Roller Cone
WOH = Weight of 140lb. Hammer
WOR/C = Weight of Rods or Casing
WO1P = Weight of One Person
S_u = Peak/Remolded Field Vane Undrained Shear Strength (psf)
$S_{u(lab)}$ = Lab Vane Undrained Shear Strength (psf)
q_p = Unconfined Compressive Strength (ksf)
N-uncorrected = Raw Field SPT N-value
Hammer Efficiency Factor = Rig Specific Annual Calibration Value
N_{60} = SPT N-uncorrected Corrected for Hammer Efficiency
N_{60} = (Hammer Efficiency Factor/60%)*N-uncorrected
T_v = Pocket Torvane Shear Strength (psf)
WC = Water Content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (ft.)	Sample Information: Sample No.	Pen./Rec. (in.)	Sample Depth (ft.)	Blows (/6 in.) Shear Strength (psf) or RQD (%)	N-uncorrected	N_{60}	Casing Blows	Elevation (ft.)	Graphic Log	Visual Description and Remarks	Laboratory Testing Results/ AASHTO and Unified Class.
0										Note: No soil samples collected in upper 5 ft. SSA used to determine refusal depth and approximate depth to water. Strata descriptions determined from drill cutting observations. -LANDFILL WASTE AND COVER-	
5	1D	24/20	5.0 - 7.0	1/1/1/1	2	3		14.2		5.0 Dark grey to black, wet, very loose, Silty fine SAND, trace medium sand -TIDAL MARSH DEPOSIT-(SM)	
10								9.6		Refusal at 9.6 ft on probable bedrock 9.6 **Bottom of Exploration at 9.6 feet below ground surface.** Note: Installed observation well - see Observation Well Installation Report HA22-10(OW) for details.	
15											
20											
25											

Remarks:

Note: Auger refusal at multiple locations at 5.2 ft, 3.2 ft, 3.5 ft, 6.9 ft below ground surface. Auger cuttings indicate LANDFILL WASTE AND COVER.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

Boring No.: HA22-10(OW)

ROCK CORE PHOTOGRAPHS
MACHIAS LANDFILL INVESTIGATION
MACHIAS, MAINE
FILE NO. 0130749-009

Top Row: HA22-2, Run No. C1 10.3 (left) to 12.0 (middle-left); Run No. C2 12.0 (middle-left) to 15.3 (right)
Top Middle Row: HA22-5, Run No. C1 32.5 (left) to 37.5 (right)
Bottom Middle Row: HA22-1, Run No. C1 39.0 (left) to 44.0 (right)
Bottom Row: empty

APPENDIX B
Observation Well Installation and Groundwater Monitoring Reports

OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

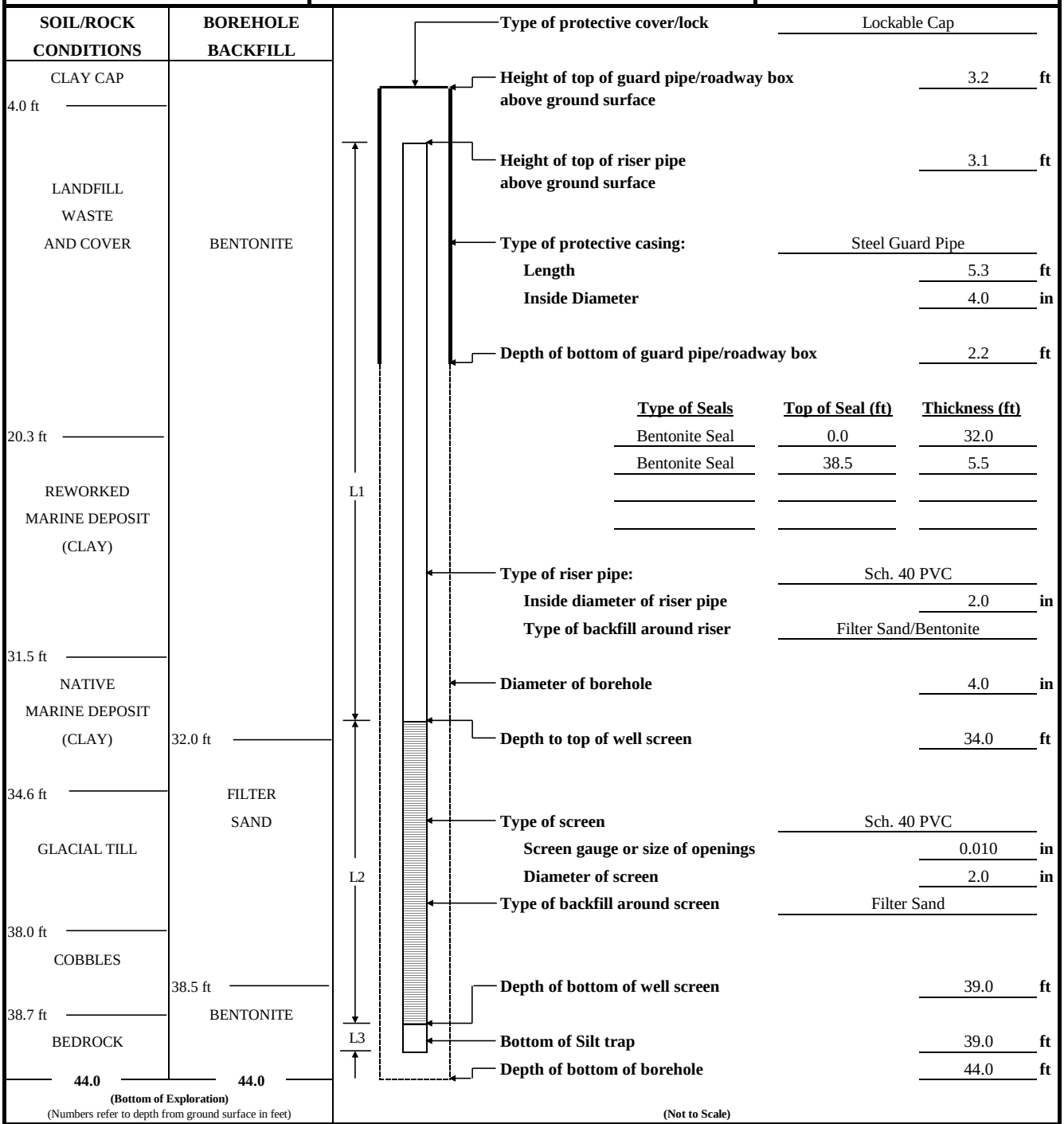
Well No. HA22-1 (OW)
Boring No. HA22-1

PROJECT	Machias Landfill Investigation, Machias Dike Bridge	**H&A FILE NO.**	130749-009
LOCATION	Machias, Maine	**PROJECT MGR.**	D. Dearden
CLIENT	Maine Department of Transportation	**FIELD REP.**	H. Hollauer
CONTRACTOR	New England Boring Contractors, Inc.	**DATE INSTALLED**	6/30/2022
DRILLER	T. Schaeffer	**WATER LEVEL**	19.4 ft (below ground surface)

Ground El. 46.7 ft
El. Datum NAVD 88

Location See Plan

☑ **Guard Pipe**
☐ **Roadway Box**



Type of protective cover/lock Lockable Cap

Height of top of guard pipe/roadway box above ground surface 3.2 ft

Height of top of riser pipe above ground surface 3.1 ft

Type of protective casing: Steel Guard Pipe
Length 5.3 ft
Inside Diameter 4.0 in

Depth of bottom of guard pipe/roadway box 2.2 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite Seal	0.0	32.0
Bentonite Seal	38.5	5.5

Type of riser pipe: Sch. 40 PVC
Inside diameter of riser pipe 2.0 in
Type of backfill around riser Filter Sand/Bentonite

Diameter of borehole 4.0 in

Depth to top of well screen 34.0 ft

Type of screen Sch. 40 PVC
Screen gauge or size of openings 0.010 in
Diameter of screen 2.0 in
Type of backfill around screen Filter Sand

Depth of bottom of well screen 39.0 ft

Bottom of Silt trap 39.0 ft

Depth of bottom of borehole 44.0 ft

37.0 ft	+	5.0 ft	+	0.0 ft	=	42.0 ft
Riser Pay Length (L1)		Length of screen (L2)		Length of silt trap (L3)		Pay length

COMMENTS:

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OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

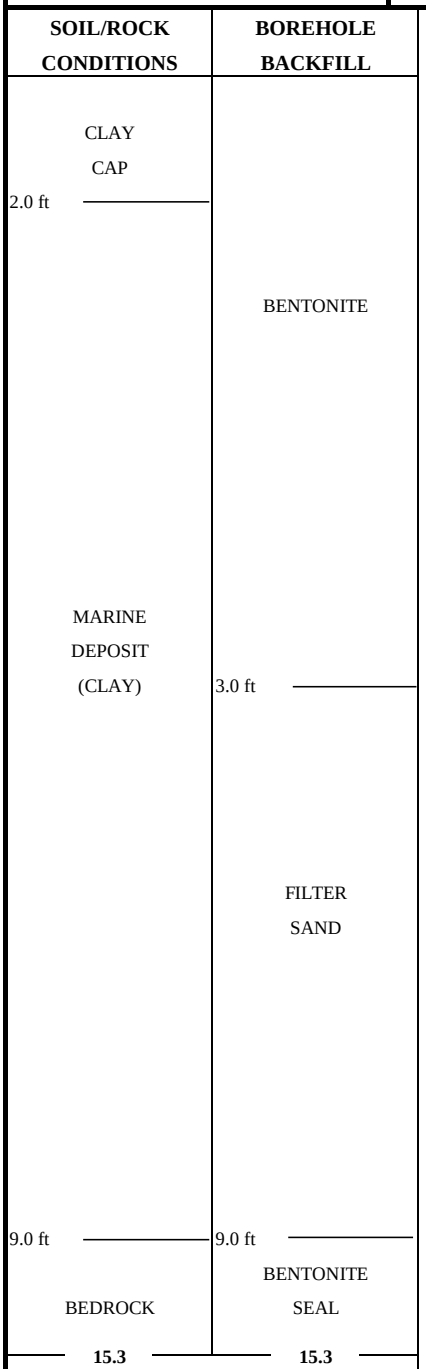
Well No. HA22-2 (OW)
Boring No. HA22-2

PROJECT	Machias Landfill Investigation, Machias Dike Bridge	**H&A FILE NO.**	130749-009
LOCATION	Machias, Maine	**PROJECT MGR.**	D. Dearden
CLIENT	Maine Department of Transportation	**FIELD REP.**	H. Hollauer
CONTRACTOR	New England Boring Contractors, Inc.	**DATE INSTALLED**	6/28/2022
DRILLER	T. Schaeffer	**WATER LEVEL**	0.5 ft (below ground surface)

Ground El. 12.6 ft
El. Datum NAVD 88

Location See Plan

☑ **Guard Pipe**
☐ **Roadway Box**



Type of protective cover/lock Lockable Cap

Height of top of guard pipe/roadway box above ground surface 3.3 ft

Height of top of riser pipe above ground surface 3.1 ft

Type of protective casing: Steel Guard Pipe
- **Length** 5.3 ft
- **Inside Diameter** 4.0 in

Depth of bottom of guard pipe/roadway box 2.4 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite Seal	0.0	3.0
Bentonite Seal	9.0	6.3

Type of riser pipe: Sch. 40 PVC
- **Inside diameter of riser pipe** 2.0 in
- **Type of backfill around riser** Filter Sand/Bentonite

Diameter of borehole 4.0 in

Depth to top of well screen 4.0 ft

Type of screen Sch. 40 PVC
- **Screen gauge or size of openings** 0.010 in
- **Diameter of screen** 2.0 in

Type of backfill around screen Filter Sand

Depth of bottom of well screen 9.0 ft

Bottom of Silt trap 9.0 ft

Depth of bottom of borehole 15.3 ft

(Not to Scale)

6.7 ft	+	5.0 ft	+	0.0 ft	=	11.7 ft
Riser Pay Length (L1)		Length of screen (L2)		Length of silt trap (L3)		Pay length

COMMENTS:

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OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

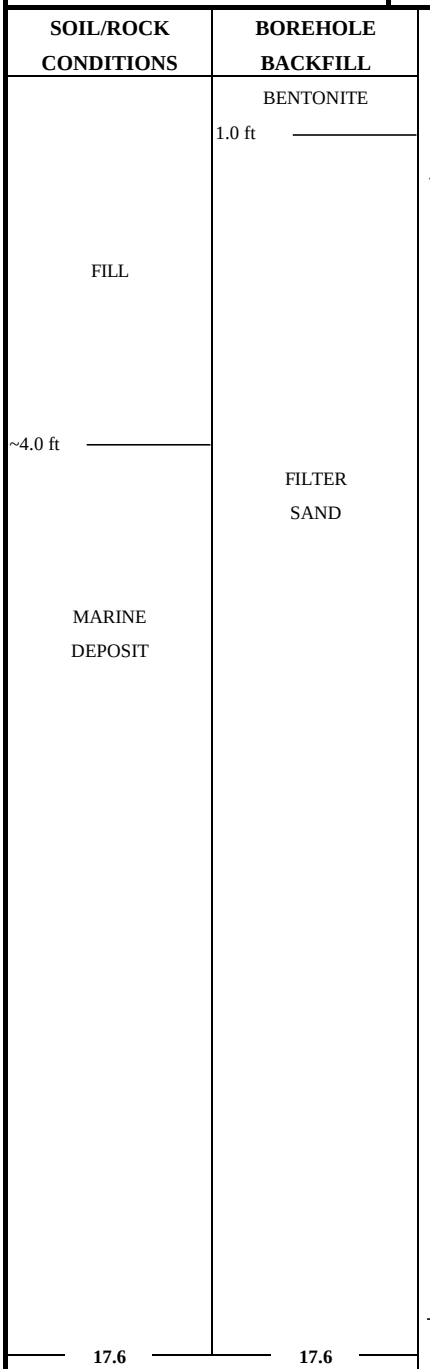
Well No. HA22-8 (OW)
Boring No. HA22-8 (OW)

PROJECT	Machias Landfill Investigation, Machias Dike Bridge	**H&A FILE NO.**	130749-009
LOCATION	Machias, Maine	**PROJECT MGR.**	D. Dearden
CLIENT	Maine Department of Transportation	**FIELD REP.**	H. Hollauer
CONTRACTOR	SW Cole Explorations	**DATE INSTALLED**	7/25/2022
DRILLER	K. Hanscom	**WATER LEVEL**	2.4 ft (below ground surface)

Ground El. 64.5 ft
El. Datum NAVD 88

Location See Plan
North side of salt pile along tree line

☑ **Guard Pipe**
☐ **Roadway Box**



Type of protective cover/lock N/A

Height of top of guard pipe/roadway box above ground surface 3.2 ft

Height of top of riser pipe above ground surface 3.0 ft

Type of protective casing: 4-in. dia. Steel Guard Pipe
Length 5.4 ft
Inside Diameter 4.0 in

Depth of bottom of guard pipe/roadway box 2.4 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite	0.0	1.0

Type of riser pipe: Sch. 40 PVC
Inside diameter of riser pipe 2.0 in
Type of backfill around riser Filter Sand

Diameter of borehole 4.0 in

Depth to top of well screen 1.3 ft

Type of screen Sch. 40 PVC
Screen gauge or size of openings 0.010 in
Diameter of screen 2.0 in
Type of backfill around screen Filter Sand

Depth of bottom of well screen 16.3 ft

Bottom of Silt trap 16.3 ft

Depth of bottom of borehole 17.6 ft

(Not to Scale)

4.1 ft	+	15.0 ft	+	0.0 ft	=	19.1 ft
Riser Pay Length (L1)		Length of screen (L2)		Length of silt trap (L3)		Pay length

COMMENTS: Soil conditions determined from drill cutting observations.

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OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

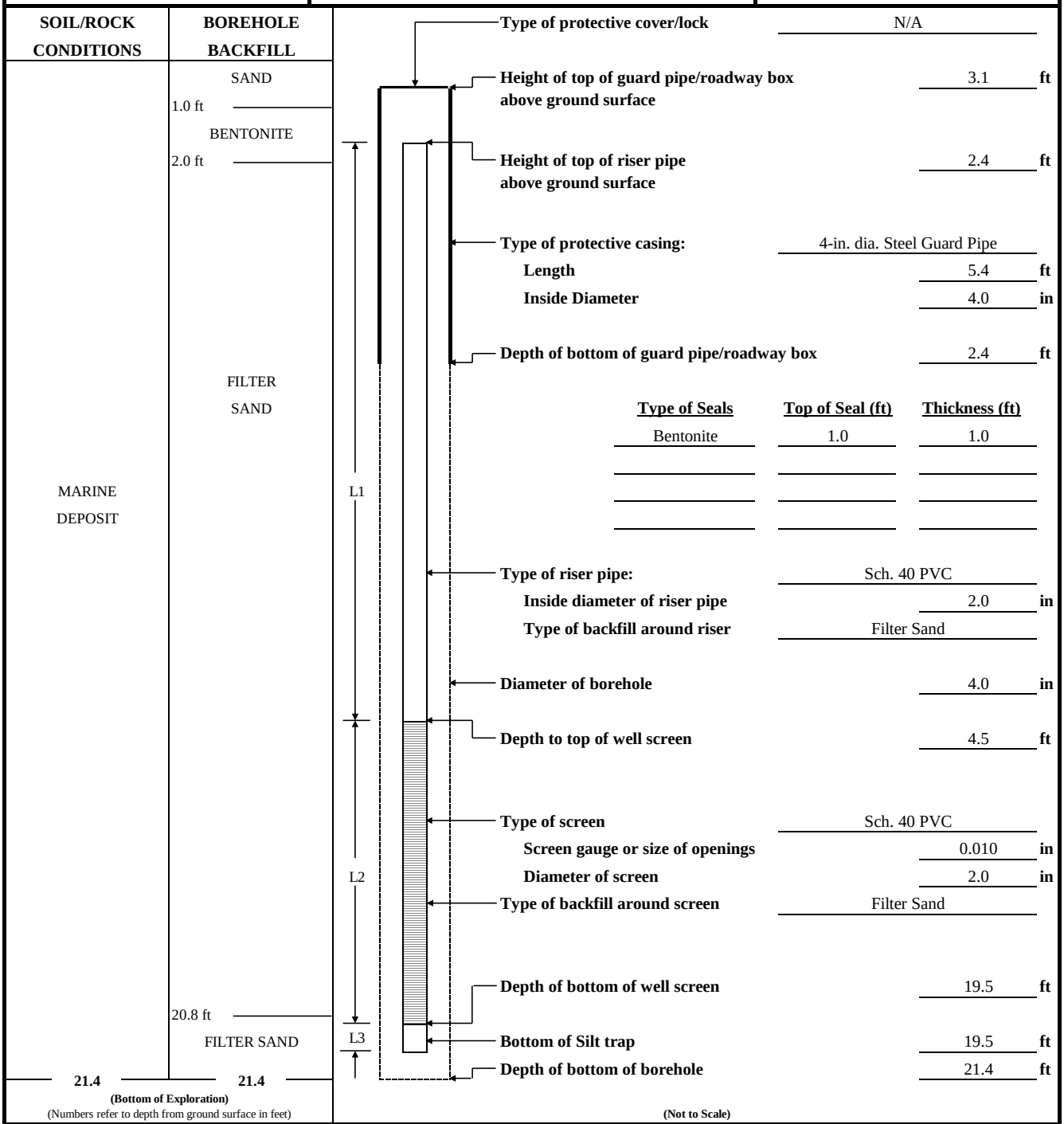
Well No. HA22-9 (OW)
Boring No. HA22-9 (OW)

PROJECT	Machias Landfill Investigation, Machias Dike Bridge	**H&A FILE NO.**	130749-009
LOCATION	Machias, Maine	**PROJECT MGR.**	D. Dearden
CLIENT	Maine Department of Transportation	**FIELD REP.**	H. Hollauer
CONTRACTOR	SW Cole Explorations	**DATE INSTALLED**	7/25/2022
DRILLER	K. Hanscom	**WATER LEVEL**	18.4 ft (below ground surface)

Ground El. 17.5 ft
El. Datum NAVD 88

Location See Plan
Approx. 7 ft west of HA22-6

☑ **Guard Pipe**
☐ **Roadway Box**



Type of protective cover/lock: N/A

Height of top of guard pipe/roadway box above ground surface: 3.1 ft

Height of top of riser pipe above ground surface: 2.4 ft

Type of protective casing: 4-in. dia. Steel Guard Pipe
- **Length:** 5.4 ft
- **Inside Diameter:** 4.0 in

Depth of bottom of guard pipe/roadway box: 2.4 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite	1.0	1.0

Type of riser pipe: Sch. 40 PVC
- **Inside diameter of riser pipe:** 2.0 in
- **Type of backfill around riser:** Filter Sand

Diameter of borehole: 4.0 in

Depth to top of well screen: 4.5 ft

Type of screen: Sch. 40 PVC
- **Screen gauge or size of openings:** 0.010 in
- **Diameter of screen:** 2.0 in
- **Type of backfill around screen:** Filter Sand

Depth of bottom of well screen: 19.5 ft

Bottom of Silt trap: 19.5 ft

Depth of bottom of borehole: 21.4 ft

6.8 ft	+	15.0 ft	+	0.0 ft	=	21.8 ft
Riser Pay Length (L1)		Length of screen (L2)		Length of silt trap (L3)		Pay length

COMMENTS: Soil conditions determined from drill cutting observations.

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OBSERVATION WELL INSTALLATION REPORT

HALEY ALDRICH

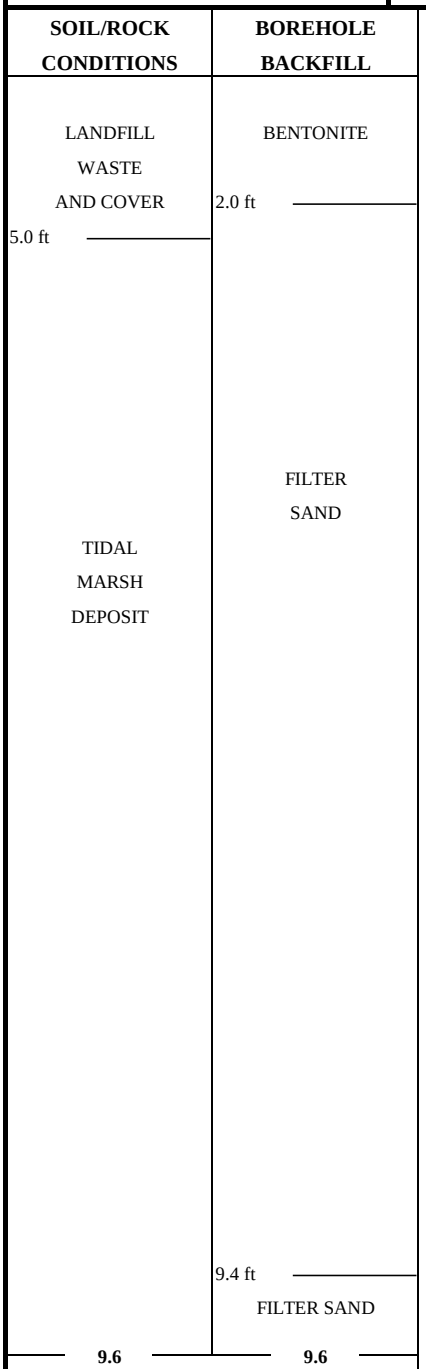
Well No. HA22-10 (OW)
Boring No. HA22-10 (OW)

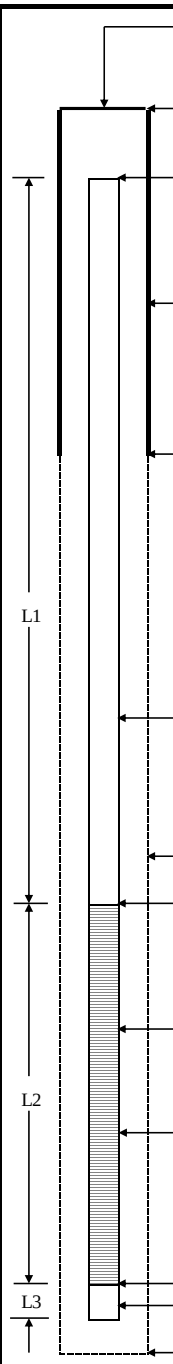
PROJECT	Machias Landfill Investigation, Machias Dike Bridge	**H&A FILE NO.**	130749-009
LOCATION	Machias, Maine	**PROJECT MGR.**	D. Dearden
CLIENT	Maine Department of Transportation	**FIELD REP.**	H. Hollauer
CONTRACTOR	SW Cole Explorations	**DATE INSTALLED**	7/26/2022
DRILLER	K. Hanscom	**WATER LEVEL**	2.0 ft (below ground surface)

Ground El. 19.2 ft
El. Datum NAVD 88

Location See Plan
South side of landfill at toe of slope

☑ **Guard Pipe**
☐ **Roadway Box**





Type of protective cover/lock N/A

Height of top of guard pipe/roadway box above ground surface 3.2 ft

Height of top of riser pipe above ground surface 2.9 ft

Type of protective casing: 4-in. dia. Steel Guard Pipe
Length 5.4 ft
Inside Diameter 4.0 in

Depth of bottom of guard pipe/roadway box 2.7 ft

Type of Seals	Top of Seal (ft)	Thickness (ft)
Bentonite	0.0	2.0

Type of riser pipe: Sch. 40 PVC
Inside diameter of riser pipe 2.0 in
Type of backfill around riser Filter Sand

Diameter of borehole 4.0 in

Depth to top of well screen 2.6 ft

Type of screen Sch. 40 PVC
Screen gauge or size of openings 0.010 in
Diameter of screen 2.0 in
Type of backfill around screen Filter Sand

Depth of bottom of well screen 9.6 ft

Bottom of Silt trap 9.6 ft

Depth of bottom of borehole 9.6 ft

5.0 ft	+	7.0 ft	+	0.0 ft	=	12.0 ft
Riser Pay Length (L1)		Length of screen (L2)		Length of silt trap (L3)		Pay length

COMMENTS:

\\haleyaldrich.com\share\por_common\PROJECTS\130749 - 2017 MEDOT Env. Multi-PIN\009 - Machias Landfill\Field

HALEY ALDRICH

GROUNDWATER MONITORING REPORT

OW/PZ NUMBER
HA22-1
Page **of**

PROJECT	Machias Landfill Investigation, Machias Dike Bridge	**H&A FILE NO.**	130749-009
LOCATION	Machias, Maine	**PROJECT MGR.**	D. Dearden
CLIENT	Maine Department of Transportation	**FIELD REP.**	H. Hollauer
CONTRACTOR	New England Boring Contractors, Inc.	**DATE**	6/30/2022

ELEVATION OF REFERENCE POINT 49.8 **REFERENCE POINT:** **Ground Surface** ☐ **PVC** ☑ **Other** ☐

Date	Time	Elapsed Time (days)	Depth of Water from Reference Point	Elevation of Water	Remarks	Read By
6/30/2022		0	22.5	27.4		HH
7/1/2022	8:00	1	29.7	20.1		HH
7/26/2022		26	30.3	19.5		HH
9/7/2022	13:45	69	30.4	19.4		JI

HALEY ALDRICH

GROUNDWATER MONITORING REPORT

OW/PZ NUMBER
HA22-2
Page **of**

PROJECT	Machias Landfill Investigation, Machias Dike Bridge	**H&A FILE NO.**	130749-009
LOCATION	Machias, Maine	**PROJECT MGR.**	D. Dearden
CLIENT	Maine Department of Transportation	**FIELD REP.**	H. Hollauer
CONTRACTOR	New England Boring Contractors, Inc.	**DATE**	6/28/2022

ELEVATION OF REFERENCE POINT 15.7 **REFERENCE POINT:** **Ground Surface** ☐ **PVC** ☑ **Other** ☐

Date	Time	Elapsed Time (days)	Depth of Water from Reference Point	Elevation of Water	Remarks	Read By
6/28/2022	8:30	0	3.6	12.1		HH
6/28/2022	14:00	0	3.7	12.0		HH
6/29/2022	7:00	1	3.7	12.0		HH
6/30/2022	7:30	2	3.8	11.9		HH
7/25/2022		27	4.1	11.6		HH
7/26/2022	8:40	28	4.1	11.6		HH
8/15/2022	14:00	48	4.6	11.2		HH
9/7/2022	13:35	71	4.0	11.7		JI

Form 2021

GROUNDWATER MONITORING REPORT

HALEY ALDRICH

OW/PZ NUMBER
HA22-8

Page of

PROJECT	Machias Landfill Investigation, Machias Dike Bridge	**H&A FILE NO.**	130749-009
LOCATION	Machias, Maine	**PROJECT MGR.**	D. Dearden
CLIENT	Maine Department of Transportation	**FIELD REP.**	H. Hollauer
CONTRACTOR	New England Boring Contractors, Inc.	**DATE**	7/25/2022

ELEVATION OF REFERENCE POINT 67.5 **REFERENCE POINT:** **Ground Surface** ☐ **PVC** ☑ **Other** ☐

Date	Time	Elapsed Time (days)	Depth of Water from Reference Point	Elevation of Water	Remarks	Read By
7/25/2022	12:30	0	5.4	62.1		HH
7/25/2022	16:30	0	9.8	57.7		HH
8/15/2022	11:00	21	11.9	55.6		HH
9/7/2022	14:30	44	10.8	56.7		JI

HALEY ALDRICH

GROUNDWATER MONITORING REPORT

OW/PZ NUMBER
HA22-9
Page **of**

PROJECT	Machias Landfill Investigation, Machias Dike Bridge	**H&A FILE NO.**	130749-009
LOCATION	Machias, Maine	**PROJECT MGR.**	D. Dearden
CLIENT	Maine Department of Transportation	**FIELD REP.**	H. Hollauer
CONTRACTOR	New England Boring Contractors, Inc.	**DATE**	7/25/2022

ELEVATION OF REFERENCE POINT 19.9 **REFERENCE POINT:** **Ground Surface** ☐ **PVC** ☑ **Other** ☐

Date	Time	Elapsed Time (days)	Depth of Water from Reference Point	Elevation of Water	Remarks	Read By
7/25/2022	16:30	0	20.8	-0.9		HH
7/26/2022	6:50	1	8.9	11.0		HH
8/15/2022	12:35	21	9.7	10.2		HH
9/7/2022	14:15	44	9.3	10.6		JI

HALEY ALDRICH

GROUNDWATER MONITORING REPORT

OW/PZ NUMBER
HA22-10
Page of

PROJECT	Machias Landfill Investigation, Machias Dike Bridge	**H&A FILE NO.**	130749-009
LOCATION	Machias, Maine	**PROJECT MGR.**	D. Dearden
CLIENT	Maine Department of Transportation	**FIELD REP.**	H. Hollauer
CONTRACTOR	New England Boring Contractors, Inc.	**DATE**	7/26/2022

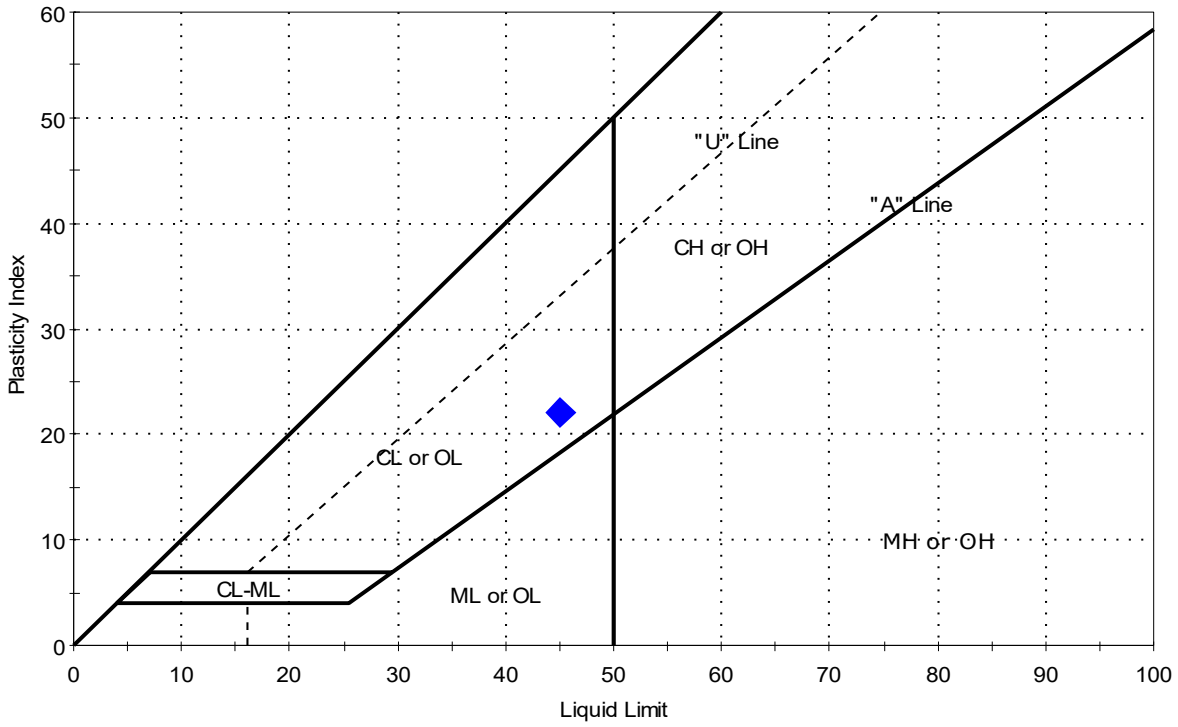
ELEVATION OF REFERENCE POINT 22.1 **REFERENCE POINT:** **Ground Surface** ☐ **PVC** ☑ **Other** ☐

Date	Time	Elapsed Time (days)	Depth of Water from Reference Point	Elevation of Water	Remarks	Read By
7/26/2022		0	4.9	17.2		HH
7/26/2022	9:45	0	5.2	17.0		HH
8/15/2022	15:15	20	3.1	19.0		HH
9/7/2022	13:25	43	2.8	19.3		JI

APPENDIX C
Geotechnical Laboratory Test Results

Client:	Haley & Aldrich, Inc.				
Project:	Machias Landfill				
Location:	Machias, ME			Project No:	GTX-315911
Boring ID:	HA22-2	Sample Type:	bag	Tested By:	cam
Sample ID:	S3	Test Date:	08/16/22	Checked By:	bfs
Depth :	4-6'	Test Id:	682011		
Test Comment:	---				
Visual Description:	Moist, light olive brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	S3	HA22-2	4-6'	30	45	23	22	0.3	

Sample Prepared using the WET method

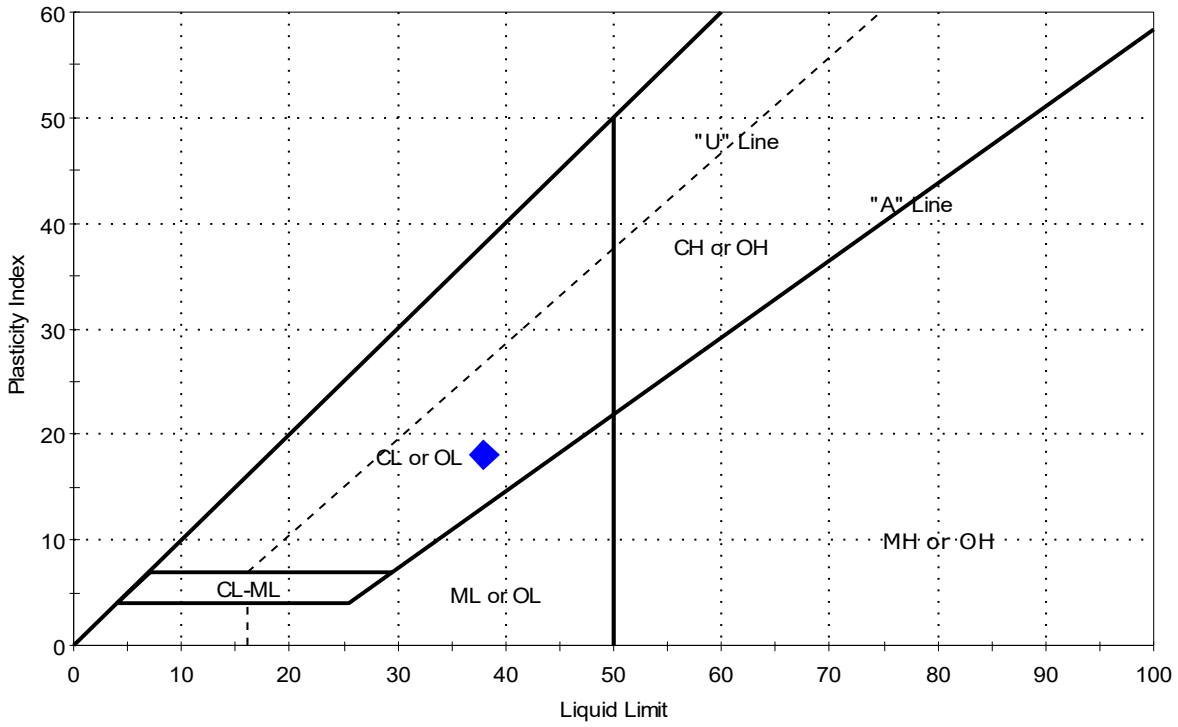
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.				
Project:	Machias Landfill				
Location:	Machias, ME			Project No:	GTX-315911
Boring ID:	HA22-5	Sample Type:	bag	Tested By:	cam
Sample ID:	S8	Test Date:	08/16/22	Checked By:	bfs
Depth :	20-22'	Test Id:	682012		
Test Comment:	---				
Visual Description:	Moist, gray clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	S8	HA22-5	20-22'	29	38	20	18	0.5	

Sample Prepared using the WET method

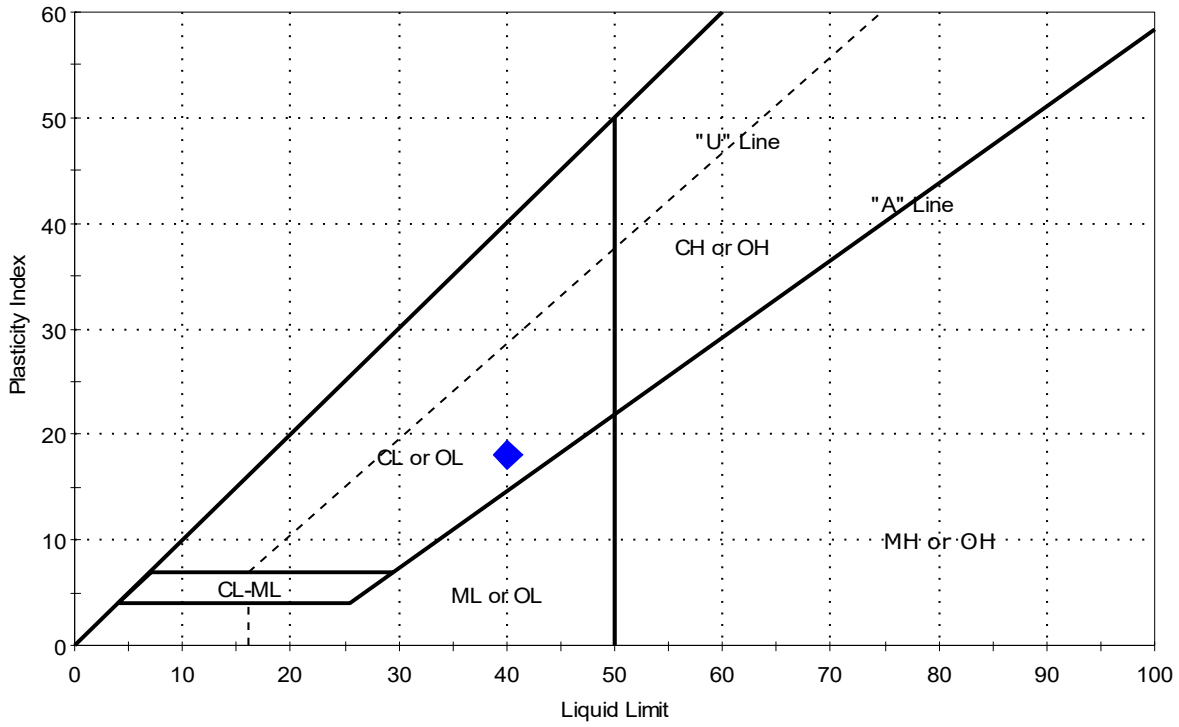
Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

Client:	Haley & Aldrich, Inc.				
Project:	Machias Landfill				
Location:	Machias, ME			Project No:	GTX-315911
Boring ID:	HA22-6	Sample Type:	bag	Tested By:	cam
Sample ID:	S3	Test Date:	08/16/22	Checked By:	bfs
Depth :	4-6'	Test Id:	682013		
Test Comment:	---				
Visual Description:	Moist, brown clay				
Sample Comment:	---				

Atterberg Limits - ASTM D4318



Symbol	Sample ID	Boring	Depth	Natural Moisture Content,%	Liquid Limit	Plastic Limit	Plasticity Index	Liquidity Index	Soil Classification
◆	S3	HA22-6	4-6'	26	40	22	18	0.2	

Sample Prepared using the WET method

Dry Strength: VERY HIGH

Dilatancy: SLOW

Toughness: LOW

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APPENDIX D
Low Flow Field Sampling Forms

HALEY ALDRICH

LOW FLOW/MNA FIELD SAMPLING FORM

PROJECT	MDOT Machias Landfill	H&A FILE NO	130749
LOCATION	Machias, Maine	PROJECT MGR.	D. Dearden
CLIENT	Maine DOT	FIELD REP.	H. Hollauer
CONTRACTOR	None	DATE INSTALLED	6/28/2022
DRILLER		WATER LEVEL	4.55

Sampling Date: 15 Aug. 2022

Well ID:	HA22-2(OW)	Well Depth:	9.0 ft	Initial Depth To Water:	4.55 ft	Purging Device:	Geotech peristaltic pump
Start time:	1400	Depth To Top Of Screen:	4.0 ft	Depth Of Pump Intake:	~8.0 ft	Tubing Present In Well:	Yes X No
Finish Time:	1510	Depth To Bottom Of Screen:	9.0 ft	Pump started 1410		Tubing Type:	Silicone and LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (ml/min) or (gal/min)	Purge Rate (ml/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temperature (°F) or (°C) +/- ___%	pH +/- ___	Conductivity (m/cm) +/- ___%	Dissolved Oxygen (mg/L) +/- ___%	Turbidity (NTU) <___NTU	ORP/eH (mv) +/- ___m	Comments
1415	5.68		~300		19.41	6.45	3.00	1.42	28.3	146	Clear, no odor
1420	6.30				19.10	6.43	2.93	0.76	22.8	146	
1425	6.82				18.99	6.42	2.87	0.48	17.1	138	
1430	7.00				18.80	6.41	2.85	0.33	14.9	136	
1433	7.25			~1.0	18.65	6.41	2.85	0.19	11.7	135	
											Collected sample prior to full stabillzation because well possibly may be pumped dry.
											DTW at end of sampling = 8.88
											The hole for the lock broke so unable to lock casing.
											Top PVC to Top casing = 0.15'

HexCr, etc. collected 8/16/22 @ 0800.

Sample Time 1440

PFAS Field Blank Taken

Field Blank-1 @ 8/15 @ 1430

Form 3010

HALEY ALDRICH

LOW FLOW/MNA FIELD SAMPLING FORM

PROJECT	MDOT Machias Landfill	H&A FILE NO.	130749
LOCATION	Machias, Maine	PROJECT MGR.	D. Dearden
CLIENT	Maine DOT	FIELD REP.	H. Hollauer
CONTRACTOR	None	DATE INSTALLED	7/25/2022
DRILLER		WATER LEVEL	11.90

Sampling Data: 15 Aug. 2022

Well ID:	HA22-8(ow)	Well Depth:	16.3 ft	Initial Depth To Water:	11.90 ft	Purging Device:	Geotech peristaltic pump
Start time:	1100	Depth To Top Of Screen:	1.3 ft	Depth Of Pump Intake:	~15 ft	Tubing Present In Well:	Yes X No
Finish Time:	1230	Depth To Bottom Of Screen:	16.3 ft	Pump started 1110		Tubing Type:	Silicone and LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (ml/min) or (gal/min)	Purge Rate (ml/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temperature (°F) or (°C) +/-3 %	pH +/-0.1	Conductivity mS/cm (us/cm) +/-3 %	Dissolved Oxygen (mg/L) <10%	Turbidity (NTU) <10 NTU	ORP/eH (mv) +/-10 mv	Comments
1115	12.42		~300		16.71	6.15	12.1	1.05	18.1	-44	Clear, no odor
1120	12.65				16.31	6.10	11.6	1.13	17.3	-38	Changed pump head to slower
1125	12.70		~250		17.13	6.13	11.8	2.24	20.5	-22	RPM
1130	12.75				17.90	6.20	12.1	3.92	32.8	-13	
1135	12.92				17.33	6.10	11.3	0.69	26.5	-11	
1140	13.11				17.86	6.09	11.0	0.22	15.7	-12	
1145	13.13				17.45	6.08	10.9	0.02	11.8	-13	
1148	13.15				17.49	6.08	10.8	0.00	10.2	-13	
1153	13.18				17.49	6.08	10.7	0.00	9.4	-12	
1158	13.21			~1.5gal	17.49	6.08	10.6	0.00	9.3	-12	
											Top PVC to Top Casing = 0.15'

Sample time 1200

HexCr, etc collected 8/16/22 @0720

Form 3010

HALEY ALDRICH

LOW FLOW/MNA FIELD SAMPLING FORM

PROJECT	MDOT Machias Landfill	H&A FILE NO	130749
LOCATION	Machias, Maine	PROJECT MGR.	D. Dearden
CLIENT	Maine DOT	FIELD REP.	H. Hollauer
CONTRACTOR	None	DATE INSTALLED	7/25/2022
DRILLER		WATER LEVEL	9.66

Sampling Data: 15 Aug. 2022

Well ID:	HA22-9(ow)	Well Depth:	19.5 ft	Initial Depth To Water:	9.66 ft	Purging Device:	Geotech peristaltic pump
Start time:	1235	Depth To Top Of Screen:	4.5 ft	Depth Of Pump Intake:	~18 ft	Tubing Present In Well:	Yes X No
Finish Time:	1415	Depth To Bottom Of Screen:	19.5 ft	Purging started 1240		Tubing Type:	Silicone and LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (ml/min) or (gal/min)	Purge Rate (ml/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temperature (°F) or (°C) +/- 3 %	pH +/- 0.1	Conductivity mS/cm (ms/cm) +/- 3 %	Dissolved Oxygen (mg/L) <0.5 %	Turbidity (NTU) <10 NTU	ORP/eH (mv) +/- 10 mv	Comments
1245	9.66		~300		19.56	6.60	4.90	0.95	26.5	82	Clear, no odor
1250	10.42				17.37	6.59	5.09	0.28	43.7	93	
1255	10.52				16.69	6.60	5.19	0.08	54.2	81	
1300	10.72				15.64	6.59	5.43	0.00	56.2	63	
1305	10.80				14.97	6.57	5.68	0.00	25.8	62	
1310	10.82				14.62	6.57	5.91	0.00	4.7	66	
1315	10.90				14.34	6.49	6.30	0.00	2.5	75	
1320	11.08				14.34	6.49	6.35	0.00	3.8	80	
1325	11.18			~20	14.34	6.45	6.42	0.00	4.4	79	
											Top PVC to Top Casing = 0.15'

Sample time 1330

Hex Cr sampled 8/16/22 @ 0740

Form 3010

HALEY ALDRICH

LOW FLOW/MNA FIELD SAMPLING FORM

PROJECT	MDOT Machias Landfill	H&A FILE NO.	130749
LOCATION	Machias, Maine	PROJECT MGR.	D. Dearden
CLIENT	Maine DOT	FIELD REP.	H. Hollauer
CONTRACTOR	None	DATE INSTALLED	7/26/2022
DRILLER		WATER LEVEL	3.08

Sampling Data: 15 Aug. 2022

Well ID:	HA22-10(ow)	Well Depth:	9.6 ft	Initial Depth To Water:	3.08 ft	Purging Device:	Geotech peristaltic pump
Start time:	1515	Depth To Top Of Screen:	2.6 ft	Depth Of Pump Intake:	~8' ft	Tubing Present In Well:	Yes X No
Finish Time:	1630	Depth To Bottom Of Screen:	9.6 ft	Pump start	1530	Tubing Type:	Silicone and LDPE

Elapsed Time (24 hour)	Depth To Water From Casing (ft)	Pump Setting (ml/min) or (gal/min)	Purge Rate (ml/min) or (gal/min)	Cumulative Purge Vol. (liters) or (gal)	Temperature (°F) or (°C) +/- 3 %	pH +/- 0.1	Conductivity mS/cm (ms/cm) +/- 3 %	Dissolved Oxygen (mg/L) <0.5 %	Turbidity (NTU) <10 NTU	ORP/eH (mv) +/- 10 mv	Comments
1530	3.22		~300		24.95	6.55	2.77	0.83	14.5	-88	Clear, organic odor
1535	3.22				22.01	6.53	2.87	0.26	17.3	-88	
1540	3.22				19.93	6.52	2.96	0.00	26.1	-88	
1545	3.22				19.71	6.52	2.97	0.00	25.5	-88	
1550	3.22				19.52	6.51	2.98	0.00	27.7	-88	
1555	3.22			~3/4	19.50	6.51	2.98	0.00	27.0	-88	
											Tsp PVC to Tsp casing = 0.27

Sample Time 1600

Hex Cr sampled 8/16/22 @ 0750

Form 3010

APPENDIX E
Groundwater Analytical Results

ANALYTICAL REPORT

Lab Number:	L2244025
Client:	Haley & Aldrich 75 Washington Avenue Suite 203 Portland, ME 04101-2617
ATTN:	Dave Dearden
Phone:	(207) 482-4600
Project Name:	MOOT MACHIAS LF
Project Number:	130749
Report Date:	08/25/22

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

Certifications & Approvals: MA (M-MA086), NH NELAP (2064), CT (PH-0574), IL (200077), ME (MA00086), MD (348), NJ (MA935), NY (11148), NC (25700/666), PA (68-03671), RI (LAO00065), TX (T104704476), VT (VT-0935), VA (460195), USDA (Permit #P330-17-00196).

Eight Walkup Drive, Westborough, MA 01581-1019
508-898-9220 (Fax) 508-898-9193 800-624-9220 - www.alphalab.com

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2244025-01	HA22-2(OW)	WATER	MACHIAS, ME	08/15/22 14:40	08/16/22
L2244025-02	HA22-8(OW)	WATER	MACHIAS, ME	08/15/22 12:00	08/16/22
L2244025-03	HA22-9(OW)	WATER	MACHIAS, ME	08/15/22 13:30	08/16/22
L2244025-04	HA22-10(OW)	WATER	MACHIAS, ME	08/15/22 16:00	08/16/22
L2244025-05	HA22-2(OW)	WATER	MACHIAS, ME	08/16/22 08:00	08/16/22
L2244025-06	HA22-8(OW)	WATER	MACHIAS, ME	08/16/22 07:20	08/16/22
L2244025-07	HA22-9(OW)	WATER	MACHIAS, ME	08/16/22 07:40	08/16/22
L2244025-08	HA22-10(OW)	WATER	MACHIAS, ME	08/16/22 07:50	08/16/22
L2244025-09	FIELD BLANK	WATER	MACHIAS, ME	08/15/22 14:30	08/16/22

Project Name:	MOOT MACHIAS LF	**Lab Number:**	L2244025
Project Number:	130749	**Report Date:**	08/25/22

Case Narrative

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

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

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

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

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

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

Project Name:	MOOT MACHIAS LF	**Lab Number:**	L2244025
Project Number:	130749	**Report Date:**	08/25/22

Case Narrative (continued)

Sample Receipt

L2244025-09: A sample identified as "FIELD BLANK" was received, but not listed on the Chain of Custody. At the client's request, this sample was not analyzed.

Semivolatile Organics

The WG1677442-2/-3 LCS/LCSD recoveries, associated with L2244025-01 through -04, are below the acceptance criteria for benzidine (6%/4%) and benzoic acid (0%/0%); however, it has been identified as a "difficult" analyte. The results of the associated samples are reported.

Semivolatile Organics by SIM

The WG1677444-1 Method Blank, associated with L2244025-01 through -04, has a concentration above the reporting limit for naphthalene. Since the concentrations in L2244025-01, -02, and -04 are non-detect for this target analyte, no corrective action is required. L2244025-03 was re-extracted and the associated Method Blank had a concentration above the reporting limit for naphthalene. The results of the original analysis are reported and are qualified with a "B".

Perfluorinated Alkyl Acids by Isotope Dilution

L2244025-01 through -04: Extracted Internal Standard recoveries were outside the acceptance criteria for individual analytes. Please refer to the surrogate section of the report for details.

L2244025-04: The sample was centrifuged and decanted prior to extraction due to sample matrix.

Anions by Ion Chromatography

The WG1676555-3 MS recoveries, performed on L2244025-08, are outside the acceptance criteria for chloride (122%), nitrogen, nitrate (75%), and sulfate (81%); however, the associated LCS recoveries are within criteria. No further action was taken.

The WG1677498-3 MS recovery, performed on L2244025-04, is outside the acceptance criteria for bromide (128%); however, the associated LCS recovery is within criteria. No further action was taken.

Project Name:	MOOT MACHIAS LF	**Lab Number:**	L2244025
Project Number:	130749	**Report Date:**	08/25/22

Case Narrative (continued)

The WG1676555-4 Laboratory Duplicate RPD for performed on L2244025-08, is above the acceptance criteria for sulfate; however, the sample and duplicate results are less than five times the reporting limit. Therefore, the RPD is valid.

Alkalinity, Total

The WG1678011-4 MS recovery, performed on L2244025-04, is outside the acceptance criteria for alkalinity, total (49%); however, the associated LCS recovery is within criteria. No further action was taken.

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

Authorized Signature: Kelly Stenstrom

Title: Technical Director/Representative Date: 08/25/22

ORGANICS

VOLATILES

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 08/17/22 19:46
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	3.0	--	1
1,1-Dichloroethane	1.6		ug/l	0.75	--	1
Chloroform	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
1,2-Dichloropropane	ND		ug/l	1.0	--	1
Dibromochloromethane	ND		ug/l	0.50	--	1
1,1,2-Trichloroethane	ND		ug/l	0.75	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
Trichlorofluoromethane	ND		ug/l	1.0	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
1,1,1-Trichloroethane	ND		ug/l	0.50	--	1
Bromodichloromethane	ND		ug/l	0.50	--	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	--	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	--	1
1,1-Dichloropropene	ND		ug/l	1.0	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Toluene	ND		ug/l	0.75	--	1
Ethylbenzene	ND		ug/l	0.50	--	1
Chloromethane	ND		ug/l	2.0	--	1
Bromomethane	ND		ug/l	1.0	--	1
Vinyl chloride	ND		ug/l	0.20	--	1
Chloroethane	2.2		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	--	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	--	1

Project Name: MOOT MACHIAS LF **Lab Number:** L2244025

Project Number: 130749 **Report Date:** 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01 Date Collected: 08/15/22 14:40

Client ID: HA22-2(OW) Date Received: 08/16/22

Sample Location: MACHIAS, ME Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	ND		ug/l	0.50	--	1
1,2-Dichlorobenzene	ND		ug/l	1.0	--	1
1,3-Dichlorobenzene	ND		ug/l	1.0	--	1
1,4-Dichlorobenzene	ND		ug/l	1.0	--	1
Methyl tert butyl ether	ND		ug/l	1.0	--	1
p/m-Xylene	ND		ug/l	1.0	--	1
o-Xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	--	1
Dibromomethane	ND		ug/l	1.0	--	1
Iodomethane	ND		ug/l	5.0	--	1
1,2,3-Trichloropropane	ND		ug/l	1.0	--	1
Styrene	ND		ug/l	1.0	--	1
Dichlorodifluoromethane	ND		ug/l	2.0	--	1
Acetone	ND		ug/l	5.0	--	1
Carbon disulfide	ND		ug/l	1.0	--	1
2-Butanone	ND		ug/l	5.0	--	1
Vinyl acetate	ND		ug/l	5.0	--	1
4-Methyl-2-pentanone	ND		ug/l	5.0	--	1
2-Hexanone	ND		ug/l	5.0	--	1
Acrylonitrile	ND		ug/l	5.0	--	1
Bromochloromethane	ND		ug/l	1.0	--	1
Tetrahydrofuran	2.7		ug/l	2.0	--	1
2,2-Dichloropropane	ND		ug/l	1.0	--	1
1,2-Dibromoethane	ND		ug/l	1.0	--	1
1,3-Dichloropropane	ND		ug/l	1.0	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Bromobenzene	ND		ug/l	1.0	--	1
n-Butylbenzene	ND		ug/l	0.50	--	1
sec-Butylbenzene	ND		ug/l	0.50	--	1
tert-Butylbenzene	ND		ug/l	1.0	--	1
o-Chlorotoluene	ND		ug/l	1.0	--	1
p-Chlorotoluene	ND		ug/l	1.0	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	1.0	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Isopropylbenzene	ND		ug/l	0.50	--	1
p-Isopropyltoluene	ND		ug/l	0.50	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Naphthalene	ND		ug/l	1.0	--	1
n-Propylbenzene	ND		ug/l	0.50	--	1
1,2,3-Trichlorobenzene	ND		ug/l	1.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	1.0	--	1
1,3,5-Trimethylbenzene	ND		ug/l	1.0	--	1
1,3,5-Trichlorobenzene	ND		ug/l	1.0	--	1
1,2,4-Trimethylbenzene	ND		ug/l	1.0	--	1
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	--	1
Ethyl ether	2.0		ug/l	1.0	--	1
Diisopropyl Ether	ND		ug/l	1.0	--	1
Tert-Butyl Alcohol	ND		ug/l	10	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/l	1.0	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	116		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	98		70-130
Dibromofluoromethane	102		70-130

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 08/18/22 13:25
Analyst: BB

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	32.6		ug/l	2.00	--	1	A
Ethene	ND		ug/l	0.500	--	1	A
Ethane	ND		ug/l	0.500	--	1	A

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 08/17/22 20:07
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	3.0	--	1
1,1-Dichloroethane	ND		ug/l	0.75	--	1
Chloroform	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
1,2-Dichloropropane	ND		ug/l	1.0	--	1
Dibromochloromethane	ND		ug/l	0.50	--	1
1,1,2-Trichloroethane	ND		ug/l	0.75	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
Trichlorofluoromethane	ND		ug/l	1.0	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
1,1,1-Trichloroethane	ND		ug/l	0.50	--	1
Bromodichloromethane	ND		ug/l	0.50	--	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	--	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	--	1
1,1-Dichloropropene	ND		ug/l	1.0	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Benzene	ND		ug/l	0.50	--	1
Toluene	ND		ug/l	0.75	--	1
Ethylbenzene	0.82		ug/l	0.50	--	1
Chloromethane	ND		ug/l	2.0	--	1
Bromomethane	ND		ug/l	1.0	--	1
Vinyl chloride	ND		ug/l	0.20	--	1
Chloroethane	ND		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	--	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	--	1

Project Name: MOOT MACHIAS LF **Lab Number:** L2244025

Project Number: 130749 **Report Date:** 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02 Date Collected: 08/15/22 12:00

Client ID: HA22-8(OW) Date Received: 08/16/22

Sample Location: MACHIAS, ME Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	ND		ug/l	0.50	--	1
1,2-Dichlorobenzene	ND		ug/l	1.0	--	1
1,3-Dichlorobenzene	ND		ug/l	1.0	--	1
1,4-Dichlorobenzene	ND		ug/l	1.0	--	1
Methyl tert butyl ether	ND		ug/l	1.0	--	1
p/m-Xylene	ND		ug/l	1.0	--	1
o-Xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	--	1
Dibromomethane	ND		ug/l	1.0	--	1
Iodomethane	ND		ug/l	5.0	--	1
1,2,3-Trichloropropane	ND		ug/l	1.0	--	1
Styrene	ND		ug/l	1.0	--	1
Dichlorodifluoromethane	ND		ug/l	2.0	--	1
Acetone	ND		ug/l	5.0	--	1
Carbon disulfide	ND		ug/l	1.0	--	1
2-Butanone	ND		ug/l	5.0	--	1
Vinyl acetate	ND		ug/l	5.0	--	1
4-Methyl-2-pentanone	ND		ug/l	5.0	--	1
2-Hexanone	ND		ug/l	5.0	--	1
Acrylonitrile	ND		ug/l	5.0	--	1
Bromochloromethane	ND		ug/l	1.0	--	1
Tetrahydrofuran	ND		ug/l	2.0	--	1
2,2-Dichloropropane	ND		ug/l	1.0	--	1
1,2-Dibromoethane	ND		ug/l	1.0	--	1
1,3-Dichloropropane	ND		ug/l	1.0	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Bromobenzene	ND		ug/l	1.0	--	1
n-Butylbenzene	ND		ug/l	0.50	--	1
sec-Butylbenzene	ND		ug/l	0.50	--	1
tert-Butylbenzene	ND		ug/l	1.0	--	1
o-Chlorotoluene	ND		ug/l	1.0	--	1
p-Chlorotoluene	ND		ug/l	1.0	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	1.0	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Isopropylbenzene	ND		ug/l	0.50	--	1
p-Isopropyltoluene	ND		ug/l	0.50	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Naphthalene	49		ug/l	1.0	--	1
n-Propylbenzene	ND		ug/l	0.50	--	1
1,2,3-Trichlorobenzene	ND		ug/l	1.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	1.0	--	1
1,3,5-Trimethylbenzene	ND		ug/l	1.0	--	1
1,3,5-Trichlorobenzene	ND		ug/l	1.0	--	1
1,2,4-Trimethylbenzene	ND		ug/l	1.0	--	1
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	--	1
Ethyl ether	ND		ug/l	1.0	--	1
Diisopropyl Ether	ND		ug/l	1.0	--	1
Tert-Butyl Alcohol	ND		ug/l	10	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/l	1.0	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	116		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	97		70-130
Dibromofluoromethane	101		70-130

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 08/18/22 13:43
Analyst: BB

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	9310		ug/l	2.00	--	1	A
Ethene	ND		ug/l	0.500	--	1	A
Ethane	ND		ug/l	0.500	--	1	A

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 08/17/22 20:29
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	3.0	--	1
1,1-Dichloroethane	ND		ug/l	0.75	--	1
Chloroform	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
1,2-Dichloropropane	ND		ug/l	1.0	--	1
Dibromochloromethane	ND		ug/l	0.50	--	1
1,1,2-Trichloroethane	ND		ug/l	0.75	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
Trichlorofluoromethane	ND		ug/l	1.0	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
1,1,1-Trichloroethane	ND		ug/l	0.50	--	1
Bromodichloromethane	ND		ug/l	0.50	--	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	--	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	--	1
1,1-Dichloropropene	ND		ug/l	1.0	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Benzene	0.55		ug/l	0.50	--	1
Toluene	ND		ug/l	0.75	--	1
Ethylbenzene	ND		ug/l	0.50	--	1
Chloromethane	ND		ug/l	2.0	--	1
Bromomethane	ND		ug/l	1.0	--	1
Vinyl chloride	ND		ug/l	0.20	--	1
Chloroethane	1.2		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	--	1
1,2-Dichloroethene, Total	0.64		ug/l	0.50	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	ND		ug/l	0.50	--	1
1,2-Dichlorobenzene	ND		ug/l	1.0	--	1
1,3-Dichlorobenzene	ND		ug/l	1.0	--	1
1,4-Dichlorobenzene	ND		ug/l	1.0	--	1
Methyl tert butyl ether	ND		ug/l	1.0	--	1
p/m-Xylene	ND		ug/l	1.0	--	1
o-Xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	0.64		ug/l	0.50	--	1
Dibromomethane	ND		ug/l	1.0	--	1
Iodomethane	ND		ug/l	5.0	--	1
1,2,3-Trichloropropane	ND		ug/l	1.0	--	1
Styrene	ND		ug/l	1.0	--	1
Dichlorodifluoromethane	ND		ug/l	2.0	--	1
Acetone	ND		ug/l	5.0	--	1
Carbon disulfide	ND		ug/l	1.0	--	1
2-Butanone	ND		ug/l	5.0	--	1
Vinyl acetate	ND		ug/l	5.0	--	1
4-Methyl-2-pentanone	ND		ug/l	5.0	--	1
2-Hexanone	ND		ug/l	5.0	--	1
Acrylonitrile	ND		ug/l	5.0	--	1
Bromochloromethane	ND		ug/l	1.0	--	1
Tetrahydrofuran	15		ug/l	2.0	--	1
2,2-Dichloropropane	ND		ug/l	1.0	--	1
1,2-Dibromoethane	ND		ug/l	1.0	--	1
1,3-Dichloropropane	ND		ug/l	1.0	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Bromobenzene	ND		ug/l	1.0	--	1
n-Butylbenzene	ND		ug/l	0.50	--	1
sec-Butylbenzene	ND		ug/l	0.50	--	1
tert-Butylbenzene	ND		ug/l	1.0	--	1
o-Chlorotoluene	ND		ug/l	1.0	--	1
p-Chlorotoluene	ND		ug/l	1.0	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	1.0	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Isopropylbenzene	ND		ug/l	0.50	--	1
p-Isopropyltoluene	ND		ug/l	0.50	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Naphthalene	ND		ug/l	1.0	--	1
n-Propylbenzene	ND		ug/l	0.50	--	1
1,2,3-Trichlorobenzene	ND		ug/l	1.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	1.0	--	1
1,3,5-Trimethylbenzene	ND		ug/l	1.0	--	1
1,3,5-Trichlorobenzene	ND		ug/l	1.0	--	1
1,2,4-Trimethylbenzene	ND		ug/l	1.0	--	1
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	--	1
Ethyl ether	19		ug/l	1.0	--	1
Diisopropyl Ether	ND		ug/l	1.0	--	1
Tert-Butyl Alcohol	15		ug/l	10	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/l	1.0	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	124		70-130
Toluene-d8	97		70-130
4-Bromofluorobenzene	101		70-130
Dibromofluoromethane	107		70-130

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 08/18/22 14:01
Analyst: BB

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	1030		ug/l	2.00	--	1	A
Ethene	ND		ug/l	0.500	--	1	A
Ethane	0.510		ug/l	0.500	--	1	A

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8260C
Analytical Date: 08/17/22 20:50
Analyst: MV

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Methylene chloride	ND		ug/l	3.0	--	1
1,1-Dichloroethane	1.3		ug/l	0.75	--	1
Chloroform	ND		ug/l	0.75	--	1
Carbon tetrachloride	ND		ug/l	0.50	--	1
1,2-Dichloropropane	ND		ug/l	1.0	--	1
Dibromochloromethane	ND		ug/l	0.50	--	1
1,1,2-Trichloroethane	ND		ug/l	0.75	--	1
Tetrachloroethene	ND		ug/l	0.50	--	1
Chlorobenzene	ND		ug/l	0.50	--	1
Trichlorofluoromethane	ND		ug/l	1.0	--	1
1,2-Dichloroethane	ND		ug/l	0.50	--	1
1,1,1-Trichloroethane	ND		ug/l	0.50	--	1
Bromodichloromethane	ND		ug/l	0.50	--	1
trans-1,3-Dichloropropene	ND		ug/l	0.50	--	1
cis-1,3-Dichloropropene	ND		ug/l	0.50	--	1
1,1-Dichloropropene	ND		ug/l	1.0	--	1
Bromoform	ND		ug/l	1.0	--	1
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Benzene	0.56		ug/l	0.50	--	1
Toluene	ND		ug/l	0.75	--	1
Ethylbenzene	ND		ug/l	0.50	--	1
Chloromethane	ND		ug/l	2.0	--	1
Bromomethane	ND		ug/l	1.0	--	1
Vinyl chloride	ND		ug/l	0.20	--	1
Chloroethane	4.0		ug/l	1.0	--	1
1,1-Dichloroethene	ND		ug/l	0.50	--	1
trans-1,2-Dichloroethene	ND		ug/l	0.75	--	1
1,2-Dichloroethene, Total	ND		ug/l	0.50	--	1

Project Name: MOOT MACHIAS LF **Lab Number:** L2244025

Project Number: 130749 **Report Date:** 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04 Date Collected: 08/15/22 16:00

Client ID: HA22-10(OW) Date Received: 08/16/22

Sample Location: MACHIAS, ME Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Trichloroethene	ND		ug/l	0.50	--	1
1,2-Dichlorobenzene	ND		ug/l	1.0	--	1
1,3-Dichlorobenzene	ND		ug/l	1.0	--	1
1,4-Dichlorobenzene	ND		ug/l	1.0	--	1
Methyl tert butyl ether	ND		ug/l	1.0	--	1
p/m-Xylene	ND		ug/l	1.0	--	1
o-Xylene	ND		ug/l	1.0	--	1
Xylenes, Total	ND		ug/l	1.0	--	1
cis-1,2-Dichloroethene	ND		ug/l	0.50	--	1
Dibromomethane	ND		ug/l	1.0	--	1
Iodomethane	ND		ug/l	5.0	--	1
1,2,3-Trichloropropane	ND		ug/l	1.0	--	1
Styrene	ND		ug/l	1.0	--	1
Dichlorodifluoromethane	ND		ug/l	2.0	--	1
Acetone	ND		ug/l	5.0	--	1
Carbon disulfide	ND		ug/l	1.0	--	1
2-Butanone	ND		ug/l	5.0	--	1
Vinyl acetate	ND		ug/l	5.0	--	1
4-Methyl-2-pentanone	ND		ug/l	5.0	--	1
2-Hexanone	ND		ug/l	5.0	--	1
Acrylonitrile	ND		ug/l	5.0	--	1
Bromochloromethane	ND		ug/l	1.0	--	1
Tetrahydrofuran	2.6		ug/l	2.0	--	1
2,2-Dichloropropane	ND		ug/l	1.0	--	1
1,2-Dibromoethane	ND		ug/l	1.0	--	1
1,3-Dichloropropane	ND		ug/l	1.0	--	1
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--	1
Bromobenzene	ND		ug/l	1.0	--	1
n-Butylbenzene	ND		ug/l	0.50	--	1
sec-Butylbenzene	ND		ug/l	0.50	--	1
tert-Butylbenzene	ND		ug/l	1.0	--	1
o-Chlorotoluene	ND		ug/l	1.0	--	1
p-Chlorotoluene	ND		ug/l	1.0	--	1
1,2-Dibromo-3-chloropropane	ND		ug/l	1.0	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Isopropylbenzene	ND		ug/l	0.50	--	1
p-Isopropyltoluene	ND		ug/l	0.50	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Volatile Organics by GC/MS - Westborough Lab						
Naphthalene	ND		ug/l	1.0	--	1
n-Propylbenzene	ND		ug/l	0.50	--	1
1,2,3-Trichlorobenzene	ND		ug/l	1.0	--	1
1,2,4-Trichlorobenzene	ND		ug/l	1.0	--	1
1,3,5-Trimethylbenzene	ND		ug/l	1.0	--	1
1,3,5-Trichlorobenzene	ND		ug/l	1.0	--	1
1,2,4-Trimethylbenzene	ND		ug/l	1.0	--	1
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	--	1
Ethyl ether	1.9		ug/l	1.0	--	1
Diisopropyl Ether	ND		ug/l	1.0	--	1
Tert-Butyl Alcohol	ND		ug/l	10	--	1
Ethyl-Tert-Butyl-Ether	ND		ug/l	1.0	--	1
Tertiary-Amyl Methyl Ether	ND		ug/l	1.0	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	115		70-130
Toluene-d8	98		70-130
4-Bromofluorobenzene	102		70-130
Dibromofluoromethane	102		70-130

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 117,-
Analytical Date: 08/18/22 15:38
Analyst: BB

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Dissolved Gases by GC - Mansfield Lab							
Methane	4090		ug/l	2.00	--	1	A
Ethene	ND		ug/l	0.500	--	1	A
Ethane	2.63		ug/l	0.500	--	1	A

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 117,-
Analytical Date: 08/18/22 09:30
Analyst: BB

Parameter	Result	Qualifier	Units	RL	MDL	
Dissolved Gases by GC - Mansfield Lab for sample(s): 01-04 Batch: WG1676908-3						
Methane	ND		ug/l	2.00	--	A
Ethene	ND		ug/l	0.500	--	A
Ethane	ND		ug/l	0.500	--	A

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 08/17/22 18:43
Analyst: LAC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-04 Batch: WG1677231-5					
Methylene chloride	ND		ug/l	3.0	--
1,1-Dichloroethane	ND		ug/l	0.75	--
Chloroform	ND		ug/l	0.75	--
Carbon tetrachloride	ND		ug/l	0.50	--
1,2-Dichloropropane	ND		ug/l	1.0	--
Dibromochloromethane	ND		ug/l	0.50	--
1,1,2-Trichloroethane	ND		ug/l	0.75	--
Tetrachloroethene	ND		ug/l	0.50	--
Chlorobenzene	ND		ug/l	0.50	--
Trichlorofluoromethane	ND		ug/l	1.0	--
1,2-Dichloroethane	ND		ug/l	0.50	--
1,1,1-Trichloroethane	ND		ug/l	0.50	--
Bromodichloromethane	ND		ug/l	0.50	--
trans-1,3-Dichloropropene	ND		ug/l	0.50	--
cis-1,3-Dichloropropene	ND		ug/l	0.50	--
1,1-Dichloropropene	ND		ug/l	1.0	--
Bromoform	ND		ug/l	1.0	--
1,1,2,2-Tetrachloroethane	ND		ug/l	0.50	--
Benzene	ND		ug/l	0.50	--
Toluene	ND		ug/l	0.75	--
Ethylbenzene	ND		ug/l	0.50	--
Chloromethane	ND		ug/l	2.0	--
Bromomethane	ND		ug/l	1.0	--
Vinyl chloride	ND		ug/l	0.20	--
Chloroethane	ND		ug/l	1.0	--
1,1-Dichloroethene	ND		ug/l	0.50	--
trans-1,2-Dichloroethene	ND		ug/l	0.75	--
1,2-Dichloroethene, Total	ND		ug/l	0.50	--
Trichloroethene	ND		ug/l	0.50	--

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 08/17/22 18:43
Analyst: LAC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-04 Batch: WG1677231-5					
1,2-Dichlorobenzene	ND		ug/l	1.0	--
1,3-Dichlorobenzene	ND		ug/l	1.0	--
1,4-Dichlorobenzene	ND		ug/l	1.0	--
Methyl tert butyl ether	ND		ug/l	1.0	--
p/m-Xylene	ND		ug/l	1.0	--
o-Xylene	ND		ug/l	1.0	--
Xylenes, Total	ND		ug/l	1.0	--
cis-1,2-Dichloroethene	ND		ug/l	0.50	--
Dibromomethane	ND		ug/l	1.0	--
Iodomethane	ND		ug/l	5.0	--
1,2,3-Trichloropropane	ND		ug/l	1.0	--
Styrene	ND		ug/l	1.0	--
Dichlorodifluoromethane	ND		ug/l	2.0	--
Acetone	ND		ug/l	5.0	--
Carbon disulfide	ND		ug/l	1.0	--
2-Butanone	ND		ug/l	5.0	--
Vinyl acetate	ND		ug/l	5.0	--
4-Methyl-2-pentanone	ND		ug/l	5.0	--
2-Hexanone	ND		ug/l	5.0	--
Acrylonitrile	ND		ug/l	5.0	--
Bromochloromethane	ND		ug/l	1.0	--
Tetrahydrofuran	ND		ug/l	2.0	--
2,2-Dichloropropane	ND		ug/l	1.0	--
1,2-Dibromoethane	ND		ug/l	1.0	--
1,3-Dichloropropane	ND		ug/l	1.0	--
1,1,1,2-Tetrachloroethane	ND		ug/l	0.50	--
Bromobenzene	ND		ug/l	1.0	--
n-Butylbenzene	ND		ug/l	0.50	--
sec-Butylbenzene	ND		ug/l	0.50	--

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8260C
Analytical Date: 08/17/22 18:43
Analyst: LAC

Parameter	Result	Qualifier	Units	RL	MDL
Volatile Organics by GC/MS - Westborough Lab for sample(s): 01-04 Batch: WG1677231-5					
tert-Butylbenzene	ND		ug/l	1.0	--
o-Chlorotoluene	ND		ug/l	1.0	--
p-Chlorotoluene	ND		ug/l	1.0	--
1,2-Dibromo-3-chloropropane	ND		ug/l	1.0	--
Hexachlorobutadiene	ND		ug/l	0.50	--
Isopropylbenzene	ND		ug/l	0.50	--
p-Isopropyltoluene	ND		ug/l	0.50	--
Naphthalene	ND		ug/l	1.0	--
n-Propylbenzene	ND		ug/l	0.50	--
1,2,3-Trichlorobenzene	ND		ug/l	1.0	--
1,2,4-Trichlorobenzene	ND		ug/l	1.0	--
1,3,5-Trimethylbenzene	ND		ug/l	1.0	--
1,3,5-Trichlorobenzene	ND		ug/l	1.0	--
1,2,4-Trimethylbenzene	ND		ug/l	1.0	--
trans-1,4-Dichloro-2-butene	ND		ug/l	2.5	--
Ethyl ether	ND		ug/l	1.0	--
Diisopropyl Ether	ND		ug/l	1.0	--
Tert-Butyl Alcohol	ND		ug/l	10	--
Ethyl-Tert-Butyl-Ether	ND		ug/l	1.0	--
Tertiary-Amyl Methyl Ether	ND		ug/l	1.0	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
1,2-Dichloroethane-d4	111		70-130
Toluene-d8	101		70-130
4-Bromofluorobenzene	105		70-130
Dibromofluoromethane	101		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 01-04 Batch: WG1676908-2									
Methane	102		-		80-120	-		25	A
Ethene	98		-		80-120	-		25	A
Ethane	96		-		80-120	-		25	A

Lab Control Sample Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-04 Batch: WG1677231-3 WG1677231-4								
Methylene chloride	90		86		70-130	5		20
1,1-Dichloroethane	100		97		70-130	3		20
Chloroform	94		89		70-130	5		20
Carbon tetrachloride	90		86		63-132	5		20
1,2-Dichloropropane	95		90		70-130	5		20
Dibromochloromethane	88		84		63-130	5		20
1,1,2-Trichloroethane	98		94		70-130	4		20
Tetrachloroethene	110		98		70-130	12		20
Chlorobenzene	97		89		75-130	9		25
Trichlorofluoromethane	120		110		62-150	9		20
1,2-Dichloroethane	100		100		70-130	0		20
1,1,1-Trichloroethane	94		88		67-130	7		20
Bromodichloromethane	87		82		67-130	6		20
trans-1,3-Dichloropropene	83		75		70-130	10		20
cis-1,3-Dichloropropene	74		71		70-130	4		20
1,1-Dichloropropene	100		97		70-130	3		20
Bromoform	81		74		54-136	9		20
1,1,2,2-Tetrachloroethane	98		89		67-130	10		20
Benzene	95		90		70-130	5		25
Toluene	96		88		70-130	9		25
Ethylbenzene	95		88		70-130	8		20
Chloromethane	110		110		64-130	0		20
Bromomethane	91		87		39-139	4		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-04 Batch: WG1677231-3 WG1677231-4								
Vinyl chloride	120		110		55-140	9		20
Chloroethane	110		100		55-138	10		20
1,1-Dichloroethene	100		97		61-145	3		25
trans-1,2-Dichloroethene	97		95		70-130	2		20
Trichloroethene	95		92		70-130	3		25
1,2-Dichlorobenzene	95		86		70-130	10		20
1,3-Dichlorobenzene	100		88		70-130	13		20
1,4-Dichlorobenzene	97		87		70-130	11		20
Methyl tert butyl ether	84		82		63-130	2		20
p/m-Xylene	100		90		70-130	11		20
o-Xylene	95		85		70-130	11		20
cis-1,2-Dichloroethene	91		88		70-130	3		20
Dibromomethane	90		85		70-130	6		20
Iodomethane	**52**	Q	**48**	Q	70-130	8		20
1,2,3-Trichloropropane	97		92		64-130	5		20
Styrene	95		90		70-130	5		20
Dichlorodifluoromethane	100		100		36-147	0		20
Acetone	110		120		58-148	9		20
Carbon disulfide	100		100		51-130	0		20
2-Butanone	100		110		63-138	10		20
Vinyl acetate	98		98		70-130	0		20
4-Methyl-2-pentanone	88		87		59-130	1		20
2-Hexanone	81		79		57-130	3		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-04 Batch: WG1677231-3 WG1677231-4								
Acrylonitrile	94		96		70-130	2		20
Bromochloromethane	92		89		70-130	3		20
Tetrahydrofuran	130		130		58-130	0		20
2,2-Dichloropropane	89		80		63-133	11		20
1,2-Dibromoethane	98		94		70-130	4		20
1,3-Dichloropropane	98		92		70-130	6		20
1,1,1,2-Tetrachloroethane	94		88		64-130	7		20
Bromobenzene	97		86		70-130	12		20
n-Butylbenzene	100		89		53-136	12		20
sec-Butylbenzene	98		87		70-130	12		20
tert-Butylbenzene	94		82		70-130	14		20
o-Chlorotoluene	100		88		70-130	13		20
p-Chlorotoluene	98		87		70-130	12		20
1,2-Dibromo-3-chloropropane	76		71		41-144	7		20
Hexachlorobutadiene	96		83		63-130	15		20
Isopropylbenzene	94		82		70-130	14		20
p-Isopropyltoluene	93		83		70-130	11		20
Naphthalene	80		73		70-130	9		20
n-Propylbenzene	100		90		69-130	11		20
1,2,3-Trichlorobenzene	95		86		70-130	10		20
1,2,4-Trichlorobenzene	89		79		70-130	12		20
1,3,5-Trimethylbenzene	98		86		64-130	13		20
1,3,5-Trichlorobenzene	96		87		70-130	10		20

Lab Control Sample Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Volatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-04 Batch: WG1677231-3 WG1677231-4								
1,2,4-Trimethylbenzene	93		82		70-130	13		20
trans-1,4-Dichloro-2-butene	94		85		70-130	10		20
Ethyl ether	93		88		59-134	6		20
Diisopropyl Ether	96		94		70-130	2		20
Tert-Butyl Alcohol	90		90		70-130	0		20
Ethyl-Tert-Butyl-Ether	88		85		70-130	3		20
Tertiary-Amyl Methyl Ether	77		76		66-130	1		20

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
1,2-Dichloroethane-d4	114		110		70-130
Toluene-d8	101		100		70-130
4-Bromofluorobenzene	105		102		70-130
Dibromofluoromethane	101		98		70-130

Lab Duplicate Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits	
Dissolved Gases by GC - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676908-4 QC Sample: L2244025-02 Client ID: HA22-8(OW)							
Methane	9310	9610	ug/l	3		25	A
Ethene	ND	ND	ug/l	NC		25	A
Ethane	ND	ND	ug/l	NC		25	A

SEMIVOLATILES

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8270D
Analytical Date: 08/20/22 19:04
Analyst: EK

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzidine	ND		ug/l	20	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
1,2-Dichlorobenzene	ND		ug/l	2.0	--	1
1,3-Dichlorobenzene	ND		ug/l	2.0	--	1
1,4-Dichlorobenzene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene	ND		ug/l	2.0	--	1
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorocyclopentadiene	ND		ug/l	20	--	1
Isophorone	ND		ug/l	5.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA	ND		ug/l	2.0	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1
Biphenyl	ND		ug/l	2.0	--	1
Aniline	ND		ug/l	2.0	--	1
4-Chloroaniline	ND		ug/l	5.0	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
2-Nitroaniline	ND		ug/l	5.0	--	1
3-Nitroaniline	ND		ug/l	5.0	--	1
4-Nitroaniline	ND		ug/l	5.0	--	1
Dibenzofuran	ND		ug/l	2.0	--	1
n-Nitrosodimethylamine	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
p-Chloro-m-cresol	ND		ug/l	2.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	10	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
4,6-Dinitro-o-cresol	ND		ug/l	10	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	--	1
Benzoic Acid	ND		ug/l	50	--	1
Benzyl Alcohol	ND		ug/l	2.0	--	1
Carbazole	ND		ug/l	2.0	--	1
Pyridine	ND		ug/l	3.5	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	51		21-120
Phenol-d6	43		10-120
Nitrobenzene-d5	58		23-120
2-Fluorobiphenyl	60		15-120
2,4,6-Tribromophenol	93		10-120
4-Terphenyl-d14	68		41-149

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8270D-SIM
Analytical Date: 08/20/22 20:17
Analyst: DV

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
2-Chloronaphthalene	ND		ug/l	0.20	--	1
Fluoranthene	ND		ug/l	0.10	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	0.10	--	1
Benzo(a)anthracene	ND		ug/l	0.10	--	1
Benzo(a)pyrene	ND		ug/l	0.10	--	1
Benzo(b)fluoranthene	ND		ug/l	0.10	--	1
Benzo(k)fluoranthene	ND		ug/l	0.10	--	1
Chrysene	ND		ug/l	0.10	--	1
Acenaphthylene	ND		ug/l	0.10	--	1
Anthracene	ND		ug/l	0.10	--	1
Benzo(ghi)perylene	ND		ug/l	0.10	--	1
Fluorene	ND		ug/l	0.10	--	1
Phenanthrene	ND		ug/l	0.10	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.10	--	1
Pyrene	ND		ug/l	0.10	--	1
1-Methylnaphthalene	ND		ug/l	0.10	--	1
2-Methylnaphthalene	ND		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	0.80	--	1
Hexachlorobenzene	ND		ug/l	0.80	--	1
Hexachloroethane	ND		ug/l	0.80	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	58		21-120
Phenol-d6	47		10-120
Nitrobenzene-d5	70		23-120
2-Fluorobiphenyl	67		15-120
2,4,6-Tribromophenol	107		10-120
4-Terphenyl-d14	67		41-149

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 08/18/22 15:44
Analyst: MP

Extraction Method: ALPHA 23528
Extraction Date: 08/17/22 17:51

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	9.19		ng/l	1.83	--	1
Perfluoropentanoic Acid (PFPeA)	13.3		ng/l	1.83	--	1
Perfluorobutanesulfonic Acid (PFBS)	2.67		ng/l	1.83	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.83	--	1
Perfluorohexanoic Acid (PFHxA)	23.1		ng/l	1.83	--	1
Perfluoropentanesulfonic Acid (PFPeS)	2.17		ng/l	1.83	--	1
Perfluoroheptanoic Acid (PFHpA)	22.5		ng/l	1.83	--	1
Perfluorohexanesulfonic Acid (PFHxS)	26.8		ng/l	1.83	--	1
Perfluorooctanoic Acid (PFOA)	84.0		ng/l	1.83	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	3.29		ng/l	1.83	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.83	--	1
Perfluorononanoic Acid (PFNA)	3.57		ng/l	1.83	--	1
Perfluorooctanesulfonic Acid (PFOS)	35.7		ng/l	1.83	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.83	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.83	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.83	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.83	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.83	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.83	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.83	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.83	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.83	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.83	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.83	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	45.7	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.83	--	1
Perfluorohexadecanoic Acid (PFHxDA)	ND		ng/l	3.66	--	1

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctadecanoic Acid (PFODA)	ND		ng/l	3.66	--	1
PFAS, Total (6)	173		ng/l	1.83	--	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	89		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	91		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	89		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	**230**	Q	12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	73		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	76		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	86		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	92		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**199**	Q	14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	104		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	104		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)	144		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	62		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	73		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	18		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	54		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	62		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	79		22-136
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	94		10-165
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	52		10-206

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8270D
Analytical Date: 08/20/22 19:27
Analyst: EK

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzidine	ND		ug/l	20	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
1,2-Dichlorobenzene	ND		ug/l	2.0	--	1
1,3-Dichlorobenzene	ND		ug/l	2.0	--	1
1,4-Dichlorobenzene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene	ND		ug/l	2.0	--	1
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorocyclopentadiene	ND		ug/l	20	--	1
Isophorone	ND		ug/l	5.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA	ND		ug/l	2.0	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1
Biphenyl	ND		ug/l	2.0	--	1
Aniline	ND		ug/l	2.0	--	1
4-Chloroaniline	ND		ug/l	5.0	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
2-Nitroaniline	ND		ug/l	5.0	--	1
3-Nitroaniline	ND		ug/l	5.0	--	1
4-Nitroaniline	ND		ug/l	5.0	--	1
Dibenzofuran	ND		ug/l	2.0	--	1
n-Nitrosodimethylamine	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
p-Chloro-m-cresol	ND		ug/l	2.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	10	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
4,6-Dinitro-o-cresol	ND		ug/l	10	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	--	1
Benzoic Acid	ND		ug/l	50	--	1
Benzyl Alcohol	ND		ug/l	2.0	--	1
Carbazole	ND		ug/l	2.0	--	1
Pyridine	ND		ug/l	3.5	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	58		21-120
Phenol-d6	48		10-120
Nitrobenzene-d5	68		23-120
2-Fluorobiphenyl	73		15-120
2,4,6-Tribromophenol	90		10-120
4-Terphenyl-d14	80		41-149

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8270D-SIM
Analytical Date: 08/20/22 20:33
Analyst: DV

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	1.6		ug/l	0.10	--	1
2-Chloronaphthalene	ND		ug/l	0.20	--	1
Fluoranthene	0.19		ug/l	0.10	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	5.9		ug/l	0.10	--	1
Benzo(a)anthracene	ND		ug/l	0.10	--	1
Benzo(a)pyrene	ND		ug/l	0.10	--	1
Benzo(b)fluoranthene	ND		ug/l	0.10	--	1
Benzo(k)fluoranthene	ND		ug/l	0.10	--	1
Chrysene	ND		ug/l	0.10	--	1
Acenaphthylene	0.20		ug/l	0.10	--	1
Anthracene	0.20		ug/l	0.10	--	1
Benzo(ghi)perylene	ND		ug/l	0.10	--	1
Fluorene	1.4		ug/l	0.10	--	1
Phenanthrene	1.2		ug/l	0.10	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.10	--	1
Pyrene	0.18		ug/l	0.10	--	1
1-Methylnaphthalene	3.1		ug/l	0.10	--	1
2-Methylnaphthalene	1.6		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	0.80	--	1
Hexachlorobenzene	ND		ug/l	0.80	--	1
Hexachloroethane	ND		ug/l	0.80	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	58		21-120
Phenol-d6	49		10-120
Nitrobenzene-d5	71		23-120
2-Fluorobiphenyl	69		15-120
2,4,6-Tribromophenol	111		10-120
4-Terphenyl-d14	69		41-149

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 08/18/22 16:00
Analyst: MP

Extraction Method: ALPHA 23528
Extraction Date: 08/17/22 17:51

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	ND		ng/l	1.87	--	1
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	1.87	--	1
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.87	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.87	--	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.87	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.87	--	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.87	--	1
Perfluorohexanesulfonic Acid (PFHxS)	16.3		ng/l	1.87	--	1
Perfluorooctanoic Acid (PFOA)	2.18		ng/l	1.87	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	3.46		ng/l	1.87	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.87	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.87	--	1
Perfluorooctanesulfonic Acid (PFOS)	8.02		ng/l	1.87	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.87	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.87	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.87	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.87	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.87	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.87	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.87	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.87	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.87	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.87	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.87	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	46.7	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.87	--	1
Perfluorohexadecanoic Acid (PFHxDA)	ND		ng/l	3.74	--	1

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctadecanoic Acid (PFODA)	ND		ng/l	3.74	--	1
PFAS, Total (6)	26.5		ng/l	1.87	--	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	90		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	112		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	99		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	**234**	Q	12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	81		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	84		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	95		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	95		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**179**	Q	14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	108		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	112		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	94		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	119		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	73		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	75		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	16		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	66		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	65		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	83		22-136
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	103		10-165
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	48		10-206

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8270D
Analytical Date: 08/20/22 19:49
Analyst: EK

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzidine	ND		ug/l	20	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
1,2-Dichlorobenzene	ND		ug/l	2.0	--	1
1,3-Dichlorobenzene	ND		ug/l	2.0	--	1
1,4-Dichlorobenzene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene	ND		ug/l	2.0	--	1
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorocyclopentadiene	ND		ug/l	20	--	1
Isophorone	ND		ug/l	5.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA	ND		ug/l	2.0	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--	1
Bis(2-ethylhexyl)phthalate	5.6		ug/l	3.0	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1
Biphenyl	ND		ug/l	2.0	--	1
Aniline	ND		ug/l	2.0	--	1
4-Chloroaniline	ND		ug/l	5.0	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
2-Nitroaniline	ND		ug/l	5.0	--	1
3-Nitroaniline	ND		ug/l	5.0	--	1
4-Nitroaniline	ND		ug/l	5.0	--	1
Dibenzofuran	ND		ug/l	2.0	--	1
n-Nitrosodimethylamine	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
p-Chloro-m-cresol	ND		ug/l	2.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	10	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
4,6-Dinitro-o-cresol	ND		ug/l	10	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	--	1
Benzoic Acid	ND		ug/l	50	--	1
Benzyl Alcohol	ND		ug/l	2.0	--	1
Carbazole	ND		ug/l	2.0	--	1
Pyridine	ND		ug/l	3.5	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	55		21-120
Phenol-d6	46		10-120
Nitrobenzene-d5	63		23-120
2-Fluorobiphenyl	66		15-120
2,4,6-Tribromophenol	90		10-120
4-Terphenyl-d14	66		41-149

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8270D-SIM
Analytical Date: 08/20/22 20:49
Analyst: AH

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
2-Chloronaphthalene	ND		ug/l	0.20	--	1
Fluoranthene	ND		ug/l	0.10	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	0.29	B	ug/l	0.10	--	1
Benzo(a)anthracene	ND		ug/l	0.10	--	1
Benzo(a)pyrene	ND		ug/l	0.10	--	1
Benzo(b)fluoranthene	ND		ug/l	0.10	--	1
Benzo(k)fluoranthene	ND		ug/l	0.10	--	1
Chrysene	ND		ug/l	0.10	--	1
Acenaphthylene	ND		ug/l	0.10	--	1
Anthracene	ND		ug/l	0.10	--	1
Benzo(ghi)perylene	ND		ug/l	0.10	--	1
Fluorene	ND		ug/l	0.10	--	1
Phenanthrene	ND		ug/l	0.10	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.10	--	1
Pyrene	ND		ug/l	0.10	--	1
1-Methylnaphthalene	ND		ug/l	0.10	--	1
2-Methylnaphthalene	0.12		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	0.80	--	1
Hexachlorobenzene	ND		ug/l	0.80	--	1
Hexachloroethane	ND		ug/l	0.80	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	61		21-120
Phenol-d6	51		10-120
Nitrobenzene-d5	77		23-120
2-Fluorobiphenyl	73		15-120
2,4,6-Tribromophenol	**126**	Q	10-120
4-Terphenyl-d14	74		41-149

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 08/18/22 16:17
Analyst: MP

Extraction Method: ALPHA 23528
Extraction Date: 08/17/22 17:51

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	16.1		ng/l	1.86	--	1
Perfluoropentanoic Acid (PFPeA)	16.7		ng/l	1.86	--	1
Perfluorobutanesulfonic Acid (PFBS)	3.24		ng/l	1.86	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.86	--	1
Perfluorohexanoic Acid (PFHxA)	33.0		ng/l	1.86	--	1
Perfluoropentanesulfonic Acid (PFPeS)	2.24		ng/l	1.86	--	1
Perfluoroheptanoic Acid (PFHpA)	26.2		ng/l	1.86	--	1
Perfluorohexanesulfonic Acid (PFHxS)	28.9		ng/l	1.86	--	1
Perfluorooctanoic Acid (PFOA)	59.9		ng/l	1.86	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	5.39		ng/l	1.86	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.86	--	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.86	--	1
Perfluorooctanesulfonic Acid (PFOS)	8.27	F	ng/l	1.86	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.86	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.86	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.86	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.86	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.86	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.86	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.86	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.86	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.86	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.86	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.86	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	46.4	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.86	--	1
Perfluorohexadecanoic Acid (PFHxDA)	ND		ng/l	3.71	--	1

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctadecanoic Acid (PFODA)	ND		ng/l	3.71	--	1
PFAS, Total (6)	123		ng/l	1.86	--	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	96		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	90		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	97		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	**275**	Q	12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	76		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	81		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	96		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	98		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**282**	Q	14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	115		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	105		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	88		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	**233**	Q	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)	69		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	24		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	66		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	55		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	78		22-136
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	119		10-165
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	48		10-206

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8270D
Analytical Date: 08/20/22 20:12
Analyst: EK

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
Benzidine	ND		ug/l	20	--	1
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--	1
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--	1
1,2-Dichlorobenzene	ND		ug/l	2.0	--	1
1,3-Dichlorobenzene	ND		ug/l	2.0	--	1
1,4-Dichlorobenzene	ND		ug/l	2.0	--	1
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--	1
2,4-Dinitrotoluene	ND		ug/l	5.0	--	1
2,6-Dinitrotoluene	ND		ug/l	5.0	--	1
Azobenzene	ND		ug/l	2.0	--	1
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--	1
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--	1
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--	1
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--	1
Hexachlorocyclopentadiene	ND		ug/l	20	--	1
Isophorone	ND		ug/l	5.0	--	1
Nitrobenzene	ND		ug/l	2.0	--	1
NDPA/DPA	ND		ug/l	2.0	--	1
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--	1
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--	1
Butyl benzyl phthalate	ND		ug/l	5.0	--	1
Di-n-butylphthalate	ND		ug/l	5.0	--	1
Di-n-octylphthalate	ND		ug/l	5.0	--	1
Diethyl phthalate	ND		ug/l	5.0	--	1
Dimethyl phthalate	ND		ug/l	5.0	--	1
Biphenyl	ND		ug/l	2.0	--	1
Aniline	ND		ug/l	2.0	--	1
4-Chloroaniline	ND		ug/l	5.0	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS - Westborough Lab						
2-Nitroaniline	ND		ug/l	5.0	--	1
3-Nitroaniline	ND		ug/l	5.0	--	1
4-Nitroaniline	ND		ug/l	5.0	--	1
Dibenzofuran	ND		ug/l	2.0	--	1
n-Nitrosodimethylamine	ND		ug/l	2.0	--	1
2,4,6-Trichlorophenol	ND		ug/l	5.0	--	1
p-Chloro-m-cresol	ND		ug/l	2.0	--	1
2-Chlorophenol	ND		ug/l	2.0	--	1
2,4-Dichlorophenol	ND		ug/l	5.0	--	1
2,4-Dimethylphenol	ND		ug/l	5.0	--	1
2-Nitrophenol	ND		ug/l	10	--	1
4-Nitrophenol	ND		ug/l	10	--	1
2,4-Dinitrophenol	ND		ug/l	20	--	1
4,6-Dinitro-o-cresol	ND		ug/l	10	--	1
Phenol	ND		ug/l	5.0	--	1
2-Methylphenol	ND		ug/l	5.0	--	1
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--	1
2,4,5-Trichlorophenol	ND		ug/l	5.0	--	1
Benzoic Acid	ND		ug/l	50	--	1
Benzyl Alcohol	ND		ug/l	2.0	--	1
Carbazole	2.1		ug/l	2.0	--	1
Pyridine	ND		ug/l	3.5	--	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	53		21-120
Phenol-d6	45		10-120
Nitrobenzene-d5	62		23-120
2-Fluorobiphenyl	64		15-120
2,4,6-Tribromophenol	97		10-120
4-Terphenyl-d14	71		41-149

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8270D-SIM
Analytical Date: 08/20/22 21:05
Analyst: DV

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:58

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						
Acenaphthene	ND		ug/l	0.10	--	1
2-Chloronaphthalene	ND		ug/l	0.20	--	1
Fluoranthene	ND		ug/l	0.10	--	1
Hexachlorobutadiene	ND		ug/l	0.50	--	1
Naphthalene	ND		ug/l	0.10	--	1
Benzo(a)anthracene	ND		ug/l	0.10	--	1
Benzo(a)pyrene	ND		ug/l	0.10	--	1
Benzo(b)fluoranthene	ND		ug/l	0.10	--	1
Benzo(k)fluoranthene	ND		ug/l	0.10	--	1
Chrysene	ND		ug/l	0.10	--	1
Acenaphthylene	ND		ug/l	0.10	--	1
Anthracene	ND		ug/l	0.10	--	1
Benzo(ghi)perylene	ND		ug/l	0.10	--	1
Fluorene	ND		ug/l	0.10	--	1
Phenanthrene	ND		ug/l	0.10	--	1
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--	1
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.10	--	1
Pyrene	ND		ug/l	0.10	--	1
1-Methylnaphthalene	ND		ug/l	0.10	--	1
2-Methylnaphthalene	ND		ug/l	0.10	--	1
Pentachlorophenol	ND		ug/l	0.80	--	1
Hexachlorobenzene	ND		ug/l	0.80	--	1
Hexachloroethane	ND		ug/l	0.80	--	1

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Semivolatile Organics by GC/MS-SIM - Westborough Lab						

Surrogate	% Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	47		21-120
Phenol-d6	39		10-120
Nitrobenzene-d5	57		23-120
2-Fluorobiphenyl	55		15-120
2,4,6-Tribromophenol	90		10-120
4-Terphenyl-d14	55		41-149

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 134,LCMSMS-ID
Analytical Date: 08/18/22 16:33
Analyst: MP

Extraction Method: ALPHA 23528
Extraction Date: 08/17/22 17:51

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorobutanoic Acid (PFBA)	6.28		ng/l	1.84	--	1
Perfluoropentanoic Acid (PFPeA)	8.83		ng/l	1.84	--	1
Perfluorobutanesulfonic Acid (PFBS)	2.01		ng/l	1.84	--	1
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	1.84	--	1
Perfluorohexanoic Acid (PFHxA)	13.9		ng/l	1.84	--	1
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	1.84	--	1
Perfluoroheptanoic Acid (PFHpA)	14.5		ng/l	1.84	--	1
Perfluorohexanesulfonic Acid (PFHxS)	19.1	F	ng/l	1.84	--	1
Perfluorooctanoic Acid (PFOA)	71.2		ng/l	1.84	--	1
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	5.49		ng/l	1.84	--	1
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	1.84	--	1
Perfluorononanoic Acid (PFNA)	4.60		ng/l	1.84	--	1
Perfluorooctanesulfonic Acid (PFOS)	72.0		ng/l	1.84	--	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.84	--	1
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	1.84	--	1
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	1.84	--	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.84	--	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.84	--	1
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	1.84	--	1
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	1.84	--	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	4.75		ng/l	1.84	--	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.84	--	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.84	--	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.84	--	1
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	46.1	--	1
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	1.84	--	1
Perfluorohexadecanoic Acid (PFHxDA)	ND		ng/l	3.69	--	1

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab						
Perfluorooctadecanoic Acid (PFODA)	ND		ng/l	3.69	--	1
PFAS, Total (6)	181		ng/l	1.84	--	1

Surrogate (Extracted Internal Standard)	% Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	96		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	103		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	96		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	**250**	Q	12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	74		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)	99		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	**267**	Q	14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	119		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	109		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	93		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	**204**	Q	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)	78		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	21		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	64		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	62		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	85		22-136
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	120		10-165
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	49		10-206

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 08/18/22 13:48
Analyst: MP

Extraction Method: ALPHA 23528
Extraction Date: 08/17/22 17:51

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-04 Batch: WG1676461-1					
Perfluorobutanoic Acid (PFBA)	ND		ng/l	2.00	--
Perfluoropentanoic Acid (PFPeA)	ND		ng/l	2.00	--
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND		ng/l	2.00	--
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	--
Perfluoropentanesulfonic Acid (PFPeS)	ND		ng/l	2.00	--
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	--
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	--
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND		ng/l	2.00	--
Perfluoroheptanesulfonic Acid (PFHpS)	ND		ng/l	2.00	--
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	--
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	--
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	--
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND		ng/l	2.00	--
Perfluorononanesulfonic Acid (PFNS)	ND		ng/l	2.00	--
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	--
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	--
Perfluorodecanesulfonic Acid (PFDS)	ND		ng/l	2.00	--
Perfluorooctanesulfonamide (FOSA)	ND		ng/l	2.00	--
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	--
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	--
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.00	--
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	--
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	ND		ng/l	50.0	--
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	ND		ng/l	2.00	--

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 134,LCMSMS-ID
Analytical Date: 08/18/22 13:48
Analyst: MP

Extraction Method: ALPHA 23528
Extraction Date: 08/17/22 17:51

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab for sample(s): 01-04 Batch: WG1676461-1					
Perfluorohexadecanoic Acid (PFHxDA)	ND		ng/l	4.00	--
Perfluorooctadecanoic Acid (PFODA)	ND		ng/l	4.00	--
PFAS, Total (6)	ND		ng/l	2.00	--

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	107		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	135		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	108		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	85		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	105		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	103		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	100		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	110		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	83		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	120		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	122		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	104		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	86		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	71		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	101		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	40		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	74		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	89		48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	108		22-136
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	143		10-165
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	68		10-206

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 08/20/22 14:10
Analyst: CMM

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:44

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-04 Batch: WG1677442-1					
Acenaphthene	ND		ug/l	2.0	--
Benzidine	ND		ug/l	20	--
1,2,4-Trichlorobenzene	ND		ug/l	5.0	--
Hexachlorobenzene	ND		ug/l	2.0	--
Bis(2-chloroethyl)ether	ND		ug/l	2.0	--
2-Chloronaphthalene	ND		ug/l	2.0	--
1,2-Dichlorobenzene	ND		ug/l	2.0	--
1,3-Dichlorobenzene	ND		ug/l	2.0	--
1,4-Dichlorobenzene	ND		ug/l	2.0	--
3,3'-Dichlorobenzidine	ND		ug/l	5.0	--
2,4-Dinitrotoluene	ND		ug/l	5.0	--
2,6-Dinitrotoluene	ND		ug/l	5.0	--
Azobenzene	ND		ug/l	2.0	--
Fluoranthene	ND		ug/l	2.0	--
4-Chlorophenyl phenyl ether	ND		ug/l	2.0	--
4-Bromophenyl phenyl ether	ND		ug/l	2.0	--
Bis(2-chloroisopropyl)ether	ND		ug/l	2.0	--
Bis(2-chloroethoxy)methane	ND		ug/l	5.0	--
Hexachlorobutadiene	ND		ug/l	2.0	--
Hexachlorocyclopentadiene	ND		ug/l	20	--
Hexachloroethane	ND		ug/l	2.0	--
Isophorone	ND		ug/l	5.0	--
Naphthalene	ND		ug/l	2.0	--
Nitrobenzene	ND		ug/l	2.0	--
NDPA/DPA	ND		ug/l	2.0	--
n-Nitrosodi-n-propylamine	ND		ug/l	5.0	--
Bis(2-ethylhexyl)phthalate	ND		ug/l	3.0	--
Butyl benzyl phthalate	ND		ug/l	5.0	--
Di-n-butylphthalate	ND		ug/l	5.0	--

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 08/20/22 14:10
Analyst: CMM

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:44

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-04 Batch: WG1677442-1					
Di-n-octylphthalate	ND		ug/l	5.0	--
Diethyl phthalate	ND		ug/l	5.0	--
Dimethyl phthalate	ND		ug/l	5.0	--
Benzo(a)anthracene	ND		ug/l	2.0	--
Benzo(a)pyrene	ND		ug/l	2.0	--
Benzo(b)fluoranthene	ND		ug/l	2.0	--
Benzo(k)fluoranthene	ND		ug/l	2.0	--
Chrysene	ND		ug/l	2.0	--
Acenaphthylene	ND		ug/l	2.0	--
Anthracene	ND		ug/l	2.0	--
Benzo(ghi)perylene	ND		ug/l	2.0	--
Fluorene	ND		ug/l	2.0	--
Phenanthrene	ND		ug/l	2.0	--
Dibenzo(a,h)anthracene	ND		ug/l	2.0	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	2.0	--
Pyrene	ND		ug/l	2.0	--
Biphenyl	ND		ug/l	2.0	--
Aniline	ND		ug/l	2.0	--
4-Chloroaniline	ND		ug/l	5.0	--
1-Methylnaphthalene	ND		ug/l	2.0	--
2-Nitroaniline	ND		ug/l	5.0	--
3-Nitroaniline	ND		ug/l	5.0	--
4-Nitroaniline	ND		ug/l	5.0	--
Dibenzofuran	ND		ug/l	2.0	--
2-Methylnaphthalene	ND		ug/l	2.0	--
n-Nitrosodimethylamine	ND		ug/l	2.0	--
2,4,6-Trichlorophenol	ND		ug/l	5.0	--
p-Chloro-m-cresol	ND		ug/l	2.0	--
2-Chlorophenol	ND		ug/l	2.0	--

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D
Analytical Date: 08/20/22 14:10
Analyst: CMM

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:44

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS - Westborough Lab for sample(s): 01-04 Batch: WG1677442-1					
2,4-Dichlorophenol	ND		ug/l	5.0	--
2,4-Dimethylphenol	ND		ug/l	5.0	--
2-Nitrophenol	ND		ug/l	10	--
4-Nitrophenol	ND		ug/l	10	--
2,4-Dinitrophenol	ND		ug/l	20	--
4,6-Dinitro-o-cresol	ND		ug/l	10	--
Pentachlorophenol	ND		ug/l	10	--
Phenol	ND		ug/l	5.0	--
2-Methylphenol	ND		ug/l	5.0	--
3-Methylphenol/4-Methylphenol	ND		ug/l	5.0	--
2,4,5-Trichlorophenol	ND		ug/l	5.0	--
Benzoic Acid	ND		ug/l	50	--
Benzyl Alcohol	ND		ug/l	2.0	--
Carbazole	ND		ug/l	2.0	--
Pyridine	ND		ug/l	3.5	--

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	54		21-120
Phenol-d6	40		10-120
Nitrobenzene-d5	61		23-120
2-Fluorobiphenyl	64		15-120
2,4,6-Tribromophenol	82		10-120
4-Terphenyl-d14	65		41-149

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D-SIM
Analytical Date: 08/21/22 11:38
Analyst: JJW

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:43

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-04 Batch: WG1677444-1					
Acenaphthene	ND		ug/l	0.10	--
2-Chloronaphthalene	ND		ug/l	0.20	--
Fluoranthene	ND		ug/l	0.10	--
Hexachlorobutadiene	ND		ug/l	0.50	--
Naphthalene	0.25		ug/l	0.10	--
Benzo(a)anthracene	ND		ug/l	0.10	--
Benzo(a)pyrene	ND		ug/l	0.10	--
Benzo(b)fluoranthene	ND		ug/l	0.10	--
Benzo(k)fluoranthene	ND		ug/l	0.10	--
Chrysene	ND		ug/l	0.10	--
Acenaphthylene	ND		ug/l	0.10	--
Anthracene	ND		ug/l	0.10	--
Benzo(ghi)perylene	ND		ug/l	0.10	--
Fluorene	ND		ug/l	0.10	--
Phenanthrene	ND		ug/l	0.10	--
Dibenzo(a,h)anthracene	ND		ug/l	0.10	--
Indeno(1,2,3-cd)pyrene	ND		ug/l	0.10	--
Pyrene	ND		ug/l	0.10	--
1-Methylnaphthalene	ND		ug/l	0.10	--
2-Methylnaphthalene	ND		ug/l	0.10	--
Pentachlorophenol	ND		ug/l	0.80	--
Hexachlorobenzene	ND		ug/l	0.80	--
Hexachloroethane	ND		ug/l	0.80	--

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8270D-SIM
Analytical Date: 08/21/22 11:38
Analyst: JJW

Extraction Method: EPA 3510C
Extraction Date: 08/19/22 15:43

Parameter	Result	Qualifier	Units	RL	MDL
Semivolatile Organics by GC/MS-SIM - Westborough Lab for sample(s): 01-04 Batch: WG1677444-1					

Surrogate	%Recovery	Qualifier	Acceptance Criteria
2-Fluorophenol	25		21-120
Phenol-d6	19		10-120
Nitrobenzene-d5	31		23-120
2-Fluorobiphenyl	30		15-120
2,4,6-Tribromophenol	41		10-120
4-Terphenyl-d14	**26**	Q	41-149

Lab Control Sample Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 Batch: WG1676461-2								
Perfluorobutanoic Acid (PFBA)	91		-		67-148	-		30
Perfluoropentanoic Acid (PFPeA)	93		-		63-161	-		30
Perfluorobutanesulfonic Acid (PFBS)	95		-		65-157	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	104		-		37-219	-		30
Perfluorohexanoic Acid (PFHxA)	91		-		69-168	-		30
Perfluoropentanesulfonic Acid (PFPeS)	97		-		52-156	-		30
Perfluoroheptanoic Acid (PFHpA)	93		-		58-159	-		30
Perfluorohexanesulfonic Acid (PFHxS)	112		-		69-177	-		30
Perfluorooctanoic Acid (PFOA)	90		-		63-159	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	105		-		49-187	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	84		-		61-179	-		30
Perfluorononanoic Acid (PFNA)	79		-		68-171	-		30
Perfluorooctanesulfonic Acid (PFOS)	85		-		52-151	-		30
Perfluorodecanoic Acid (PFDA)	88		-		63-171	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	132		-		56-173	-		30
Perfluorononanesulfonic Acid (PFNS)	84		-		48-150	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	102		-		60-166	-		30
Perfluoroundecanoic Acid (PFUnA)	117		-		60-153	-		30
Perfluorodecanesulfonic Acid (PFDS)	85		-		38-156	-		30
Perfluorooctanesulfonamide (FOSA)	91		-		46-170	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	91		-		45-170	-		30
Perfluorododecanoic Acid (PFDoA)	96		-		67-153	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 Batch: WG1676461-2								
Perfluorotridecanoic Acid (PFTrDA)	92		-		48-158	-		30
Perfluorotetradecanoic Acid (PFTA)	79		-		59-182	-		30
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid (HFPO-DA)	83		-		57-162	-		30
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	86		-		69-143	-		30
Perfluorohexadecanoic Acid (PFHxDA)	105		-		40-167	-		30
Perfluorooctadecanoic Acid (PFODA)	19		-		10-119	-		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 Batch: WG1676461-2								

Surrogate (Extracted Internal Standard)	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	106				58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	128				62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	105				70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	86				12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	105				57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	101				60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	100				71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	111				62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	89				14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	122				59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	120				69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	111				62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	91				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)	96				55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	44				5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	67				27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	90				48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	108				22-136
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-13C3-Propanoic Acid (M3HFPO-DA)	138				10-165
Perfluoro[13C2]Hexadecanoic Acid (M2PFHxDA)	71				10-206

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-04 Batch: WG1677442-2 WG1677442-3								
Acenaphthene	83		76		37-111	9		30
Benzidine	**6**	Q	**4**	Q	10-75	**42**	Q	30
1,2,4-Trichlorobenzene	81		73		39-98	10		30
Hexachlorobenzene	96		93		40-140	3		30
Bis(2-chloroethyl)ether	71		65		40-140	9		30
2-Chloronaphthalene	79		75		40-140	5		30
1,2-Dichlorobenzene	77		71		40-140	8		30
1,3-Dichlorobenzene	75		72		40-140	4		30
1,4-Dichlorobenzene	75		70		36-97	7		30
3,3'-Dichlorobenzidine	77		68		40-140	12		30
2,4-Dinitrotoluene	78		74		48-143	5		30
2,6-Dinitrotoluene	78		75		40-140	4		30
Azobenzene	97		87		40-140	11		30
Fluoranthene	80		79		40-140	1		30
4-Chlorophenyl phenyl ether	84		80		40-140	5		30
4-Bromophenyl phenyl ether	92		85		40-140	8		30
Bis(2-chloroisopropyl)ether	67		62		40-140	8		30
Bis(2-chloroethoxy)methane	74		69		40-140	7		30
Hexachlorobutadiene	88		83		40-140	6		30
Hexachlorocyclopentadiene	91		83		40-140	9		30
Hexachloroethane	82		81		40-140	1		30
Isophorone	75		67		40-140	11		30
Naphthalene	100		73		40-140	**31**	Q	30

Lab Control Sample Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-04 Batch: WG1677442-2 WG1677442-3								
Nitrobenzene	78		75		40-140	4		30
NDPA/DPA	84		81		40-140	4		30
n-Nitrosodi-n-propylamine	75		75		29-132	0		30
Bis(2-ethylhexyl)phthalate	101		100		40-140	1		30
Butyl benzyl phthalate	88		92		40-140	4		30
Di-n-butylphthalate	89		86		40-140	3		30
Di-n-octylphthalate	100		98		40-140	2		30
Diethyl phthalate	90		86		40-140	5		30
Dimethyl phthalate	80		77		40-140	4		30
Benzo(a)anthracene	89		84		40-140	6		30
Benzo(a)pyrene	93		86		40-140	8		30
Benzo(b)fluoranthene	91		82		40-140	10		30
Benzo(k)fluoranthene	91		84		40-140	8		30
Chrysene	82		78		40-140	5		30
Acenaphthylene	81		77		45-123	5		30
Anthracene	80		78		40-140	3		30
Benzo(ghi)perylene	80		74		40-140	8		30
Fluorene	84		79		40-140	6		30
Phenanthrene	80		74		40-140	8		30
Dibenzo(a,h)anthracene	78		74		40-140	5		30
Indeno(1,2,3-cd)pyrene	89		84		40-140	6		30
Pyrene	80		78		26-127	3		30
Biphenyl	82		78		40-140	5		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-04 Batch: WG1677442-2 WG1677442-3								
Aniline	40		**36**	Q	40-140	11		30
4-Chloroaniline	77		85		40-140	10		30
1-Methylnaphthalene	94		82		41-103	14		30
2-Nitroaniline	77		79		52-143	3		30
3-Nitroaniline	75		70		25-145	7		30
4-Nitroaniline	80		79		51-143	1		30
Dibenzofuran	84		81		40-140	4		30
2-Methylnaphthalene	120		109		40-140	10		30
n-Nitrosodimethylamine	51		51		22-74	0		30
2,4,6-Trichlorophenol	89		89		30-130	0		30
p-Chloro-m-cresol	90		86		23-97	5		30
2-Chlorophenol	78		75		27-123	4		30
2,4-Dichlorophenol	85		79		30-130	7		30
2,4-Dimethylphenol	74		75		30-130	1		30
2-Nitrophenol	79		75		30-130	5		30
4-Nitrophenol	73		71		10-80	3		30
2,4-Dinitrophenol	68		75		20-130	10		30
4,6-Dinitro-o-cresol	74		71		20-164	4		30
Pentachlorophenol	85		92		9-103	8		30
Phenol	56		54		12-110	4		30
2-Methylphenol	75		71		30-130	5		30
3-Methylphenol/4-Methylphenol	77		69		30-130	11		30
2,4,5-Trichlorophenol	89		89		30-130	0		30

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS - Westborough Lab Associated sample(s): 01-04 Batch: WG1677442-2 WG1677442-3								
Benzoic Acid	**0**	Q	**0**	Q	10-164	NC		30
Benzyl Alcohol	80		74		26-116	8		30
Carbazole	85		82		55-144	4		30
Pyridine	22		18		10-66	20		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	72		67		21-120
Phenol-d6	66		59		10-120
Nitrobenzene-d5	85		76		23-120
2-Fluorobiphenyl	83		79		15-120
2,4,6-Tribromophenol	120		115		10-120
4-Terphenyl-d14	86		87		41-149

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-04 Batch: WG1677444-2 WG1677444-3								
Acenaphthene	72		67		40-140	7		40
2-Chloronaphthalene	66		61		40-140	8		40
Fluoranthene	67		69		40-140	3		40
Hexachlorobutadiene	76		67		40-140	13		40
Naphthalene	**173**	Q	62		40-140	**94**	Q	40
Benzo(a)anthracene	72		75		40-140	4		40
Benzo(a)pyrene	66		68		40-140	3		40
Benzo(b)fluoranthene	77		76		40-140	1		40
Benzo(k)fluoranthene	77		81		40-140	5		40
Chrysene	80		76		40-140	5		40
Acenaphthylene	62		57		40-140	8		40
Anthracene	68		66		40-140	3		40
Benzo(ghi)perylene	82		82		40-140	0		40
Fluorene	71		69		40-140	3		40
Phenanthrene	70		68		40-140	3		40
Dibenzo(a,h)anthracene	85		86		40-140	1		40
Indeno(1,2,3-cd)pyrene	86		89		40-140	3		40
Pyrene	67		69		40-140	3		40
1-Methylnaphthalene	67		60		40-140	11		40
2-Methylnaphthalene	72		60		40-140	18		40
Pentachlorophenol	87		86		40-140	1		40
Hexachlorobenzene	86		80		40-140	7		40
Hexachloroethane	65		57		40-140	13		40

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits

Semivolatile Organics by GC/MS-SIM - Westborough Lab Associated sample(s): 01-04 Batch: WG1677444-2 WG1677444-3

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
2-Fluorophenol	58		53		21-120
Phenol-d6	48		45		10-120
Nitrobenzene-d5	69		65		23-120
2-Fluorobiphenyl	67		64		15-120
2,4,6-Tribromophenol	98		101		10-120
4-Terphenyl-d14	60		63		41-149

Matrix Spike Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676461-3 QC Sample: L2243218-01 Client ID: MS Sample												
Perfluorobutanoic Acid (PFBA)	15.4	37.8	50.1	92		-	-		67-148	-		30
Perfluoropentanoic Acid (PFPeA)	23.8	37.8	57.8	90		-	-		63-161	-		30
Perfluorobutanesulfonic Acid (PFBS)	26.4	33.6	58.3	95		-	-		65-157	-		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	35.5	38.4	108		-	-		37-219	-		30
Perfluorohexanoic Acid (PFHxA)	38.4	37.8	73.2	92		-	-		69-168	-		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	35.6	36.1	101		-	-		52-156	-		30
Perfluoroheptanoic Acid (PFHpA)	66.2	37.8	101	92		-	-		58-159	-		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	34.6	40.0	112		-	-		69-177	-		30
Perfluorooctanoic Acid (PFOA)	161	37.8	197	95		-	-		63-159	-		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	36	39.2	109		-	-		49-187	-		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	36.1	33.9	94		-	-		61-179	-		30
Perfluorononanoic Acid (PFNA)	ND	37.8	30.2	79		-	-		68-171	-		30
Perfluorooctanesulfonic Acid (PFOS)	ND	35.1	34.2	94		-	-		52-151	-		30
Perfluorodecanoic Acid (PFDA)	ND	37.8	33.2	88		-	-		63-171	-		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	36.3	45.4	125		-	-		56-173	-		30
Perfluorononanesulfonic Acid (PFNS)	ND	36.4	31.7	87		-	-		48-150	-		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	37.8	36.8	97		-	-		60-166	-		30
Perfluoroundecanoic Acid (PFUnA)	ND	37.8	43.3	114		-	-		60-153	-		30
Perfluorodecanesulfonic Acid (PFDS)	ND	36.5	33.0	90		-	-		38-156	-		30
Perfluorooctanesulfonamide (FOSA)	ND	37.8	35.4	94		-	-		46-170	-		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	37.8	37.2	98		-	-		45-170	-		30
Perfluorododecanoic Acid (PFDoA)	ND	37.8	37.0	98		-	-		67-153	-		30

Matrix Spike Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676461-3 QC Sample: L2243218-01 Client ID: MS Sample												
Perfluorotridecanoic Acid (PFTrDA)	ND	37.8	36.1	95		-	-		48-158	-		30
Perfluorotetradecanoic Acid (PFTA)	ND	37.8	31.0	82		-	-		59-182	-		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)	89				10-162
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	108				12-142
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	82				14-147
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	46				27-126
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	46				24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	74				55-137
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	80				62-124
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	71				57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	69				60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	100				71-134
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	71				48-131
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	95				22-136
Perfluoro[13C4]Butanoic Acid (MPFBA)	69				58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	83				62-163
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	9				5-112
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	106				69-131
Perfluoro[13C8]Octanoic Acid (M8PFOA)	72				62-129
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	90				59-139
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	103				70-131

Lab Duplicate Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676461-4 QC Sample: L2243218-02 Client ID: DUP Sample						
Perfluorobutanoic Acid (PFBA)	12.5	12.6	ng/l	1		30
Perfluoropentanoic Acid (PFPeA)	21.1	21.1	ng/l	0		30
Perfluorobutanesulfonic Acid (PFBS)	26.4	26.9	ng/l	2		30
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	ND	ND	ng/l	NC		30
Perfluorohexanoic Acid (PFHxA)	33.9	35.4	ng/l	4		30
Perfluoropentanesulfonic Acid (PFPeS)	ND	ND	ng/l	NC		30
Perfluoroheptanoic Acid (PFHpA)	58.8	59.9	ng/l	2		30
Perfluorohexanesulfonic Acid (PFHxS)	ND	ND	ng/l	NC		30
Perfluorooctanoic Acid (PFOA)	112	118	ng/l	5		30
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	ND	ND	ng/l	NC		30
Perfluoroheptanesulfonic Acid (PFHpS)	ND	ND	ng/l	NC		30
Perfluorononanoic Acid (PFNA)	ND	ND	ng/l	NC		30
Perfluorooctanesulfonic Acid (PFOS)	ND	ND	ng/l	NC		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/l	NC		30
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	ND	ND	ng/l	NC		30
Perfluorononanesulfonic Acid (PFNS)	ND	ND	ng/l	NC		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	ND	ng/l	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/l	NC		30
Perfluorodecanesulfonic Acid (PFDS)	ND	ND	ng/l	NC		30
Perfluorooctanesulfonamide (FOSA)	ND	ND	ng/l	NC		30

Lab Duplicate Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676461-4 QC Sample: L2243218-02 Client ID: DUP Sample						
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	ND	ng/l	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/l	NC		30
Perfluorotridecanoic Acid (PFTrDA)	ND	ND	ng/l	NC		30
Perfluorotetradecanoic Acid (PFTA)	ND	ND	ng/l	NC		30

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[13C4]Butanoic Acid (MPFBA)	61		64		58-132
Perfluoro[13C5]Pentanoic Acid (M5PFPEA)	74		78		62-163
Perfluoro[2,3,4-13C3]Butanesulfonic Acid (M3PFBS)	111		94		70-131
1H,1H,2H,2H-Perfluoro[1,2-13C2]Hexanesulfonic Acid (M2-4:2FTS)	99		82		12-142
Perfluoro[1,2,3,4,6-13C5]Hexanoic Acid (M5PFHxA)	58		61		57-129
Perfluoro[1,2,3,4-13C4]Heptanoic Acid (M4PFHpA)	**58**	Q	60		60-129
Perfluoro[1,2,3-13C3]Hexanesulfonic Acid (M3PFHxS)	107		91		71-134
Perfluoro[13C8]Octanoic Acid (M8PFOA)	62		66		62-129
1H,1H,2H,2H-Perfluoro[1,2-13C2]Octanesulfonic Acid (M2-6:2FTS)	81		69		14-147
Perfluoro[13C9]Nonanoic Acid (M9PFNA)	74		76		59-139
Perfluoro[13C8]Octanesulfonic Acid (M8PFOS)	110		112		69-131
Perfluoro[1,2,3,4,5,6-13C6]Decanoic Acid (M6PFDA)	73		71		62-124
1H,1H,2H,2H-Perfluoro[1,2-13C2]Decanesulfonic Acid (M2-8:2FTS)	93		79		10-162
N-Deuteriomethylperfluoro-1-octanesulfonamidoacetic Acid (d3-NMeFOSAA)	40		41		24-116
Perfluoro[1,2,3,4,5,6,7-13C7]Undecanoic Acid (M7-PFUDA)	71		70		55-137
Perfluoro[13C8]Octanesulfonamide (M8FOSA)	6		7		5-112
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	34		42		27-126
Perfluoro[1,2-13C2]Dodecanoic Acid (MPFDOA)	69		70		48-131

Lab Duplicate Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by Isotope Dilution - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676461-4 QC Sample: L2243218-02 Client ID: DUP Sample						

Surrogate (Extracted Internal Standard)	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro[1,2-13C2]Tetradecanoic Acid (M2PFTEDA)	91		92		22-136

PESTICIDES

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8081B
Analytical Date: 08/22/22 12:59
Analyst: AKM

Extraction Method: EPA 3510C
Extraction Date: 08/21/22 17:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/l	0.014	--	1	A
Lindane	ND		ug/l	0.014	--	1	A
Alpha-BHC	ND		ug/l	0.014	--	1	A
Beta-BHC	ND		ug/l	0.014	--	1	A
Heptachlor	ND		ug/l	0.014	--	1	A
Aldrin	ND		ug/l	0.014	--	1	A
Heptachlor epoxide	ND		ug/l	0.014	--	1	A
Endrin	ND		ug/l	0.029	--	1	A
Endrin aldehyde	ND		ug/l	0.029	--	1	A
Endrin ketone	ND		ug/l	0.029	--	1	A
Dieldrin	ND		ug/l	0.029	--	1	A
4,4'-DDE	ND		ug/l	0.029	--	1	A
4,4'-DDD	ND		ug/l	0.029	--	1	A
4,4'-DDT	ND		ug/l	0.029	--	1	A
Endosulfan I	ND		ug/l	0.014	--	1	A
Endosulfan II	ND		ug/l	0.029	--	1	A
Endosulfan sulfate	ND		ug/l	0.029	--	1	A
Methoxychlor	ND		ug/l	0.143	--	1	A
Toxaphene	ND		ug/l	0.143	--	1	A
Chlordane	ND		ug/l	0.143	--	1	A
cis-Chlordane	ND		ug/l	0.014	--	1	A
trans-Chlordane	ND		ug/l	0.014	--	1	A

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Pesticides by GC - Westborough Lab							

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	74		30-150	A
Decachlorobiphenyl	72		30-150	A
2,4,5,6-Tetrachloro-m-xylene	78		30-150	B
Decachlorobiphenyl	81		30-150	B

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8151A
Analytical Date: 08/20/22 22:43
Analyst: EJL

Extraction Method: EPA 8151A
Extraction Date: 08/19/22 14:02

Methylation Date: 08/20/22 09:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Chlorinated Herbicides by GC - Westborough Lab							
MCPP	ND		ug/l	500	--	1	A
MCPA	ND		ug/l	500	--	1	A
Dalapon	ND		ug/l	20.0	--	1	A
Dicamba	ND		ug/l	1.00	--	1	A
Dichloroprop	ND		ug/l	10.0	--	1	A
2,4-D	ND		ug/l	10.0	--	1	A
2,4-DB	ND		ug/l	10.0	--	1	A
2,4,5-T	ND		ug/l	2.00	--	1	A
2,4,5-TP (Silvex)	ND		ug/l	2.00	--	1	A
Dinoseb	ND		ug/l	5.00	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DCAA	126		30-150	A
DCAA	124		30-150	B

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8081B
Analytical Date: 08/22/22 13:10
Analyst: AKM

Extraction Method: EPA 3510C
Extraction Date: 08/21/22 17:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/l	0.014	--	1	A
Lindane	ND		ug/l	0.014	--	1	A
Alpha-BHC	ND		ug/l	0.014	--	1	A
Beta-BHC	ND		ug/l	0.014	--	1	A
Heptachlor	ND		ug/l	0.014	--	1	A
Aldrin	ND		ug/l	0.014	--	1	A
Heptachlor epoxide	ND		ug/l	0.014	--	1	A
Endrin	ND		ug/l	0.029	--	1	A
Endrin aldehyde	ND		ug/l	0.029	--	1	A
Endrin ketone	ND		ug/l	0.029	--	1	A
Dieldrin	ND		ug/l	0.029	--	1	A
4,4'-DDE	ND		ug/l	0.029	--	1	A
4,4'-DDD	ND		ug/l	0.029	--	1	A
4,4'-DDT	ND		ug/l	0.029	--	1	A
Endosulfan I	ND		ug/l	0.014	--	1	A
Endosulfan II	ND		ug/l	0.029	--	1	A
Endosulfan sulfate	ND		ug/l	0.029	--	1	A
Methoxychlor	ND		ug/l	0.143	--	1	A
Toxaphene	ND		ug/l	0.143	--	1	A
Chlordane	ND		ug/l	0.143	--	1	A
cis-Chlordane	ND		ug/l	0.014	--	1	A
trans-Chlordane	ND		ug/l	0.014	--	1	A

Project Name: MOOT MACHIAS LF **Lab Number:** L2244025

Project Number: 130749 **Report Date:** 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02 Date Collected: 08/15/22 12:00

Client ID: HA22-8(OW) Date Received: 08/16/22

Sample Location: MACHIAS, ME Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Pesticides by GC - Westborough Lab							

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	67		30-150	A
Decachlorobiphenyl	58		30-150	A
2,4,5,6-Tetrachloro-m-xylene	61		30-150	B
Decachlorobiphenyl	63		30-150	B

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8151A
Analytical Date: 08/20/22 23:01
Analyst: EJL

Extraction Method: EPA 8151A
Extraction Date: 08/19/22 14:02

Methylation Date: 08/20/22 09:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Chlorinated Herbicides by GC - Westborough Lab							
MCPP	ND		ug/l	500	--	1	A
MCPA	ND		ug/l	500	--	1	A
Dalapon	ND		ug/l	20.0	--	1	A
Dicamba	ND		ug/l	1.00	--	1	A
Dichloroprop	ND		ug/l	10.0	--	1	A
2,4-D	ND		ug/l	10.0	--	1	A
2,4-DB	ND		ug/l	10.0	--	1	A
2,4,5-T	ND		ug/l	2.00	--	1	A
2,4,5-TP (Silvex)	ND		ug/l	2.00	--	1	A
Dinoseb	ND		ug/l	5.00	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DCAA	123		30-150	A
DCAA	131		30-150	B

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8081B
Analytical Date: 08/22/22 13:22
Analyst: AKM

Extraction Method: EPA 3510C
Extraction Date: 08/21/22 17:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/l	0.014	--	1	A
Lindane	ND		ug/l	0.014	--	1	A
Alpha-BHC	ND		ug/l	0.014	--	1	A
Beta-BHC	ND		ug/l	0.014	--	1	A
Heptachlor	ND		ug/l	0.014	--	1	A
Aldrin	ND		ug/l	0.014	--	1	A
Heptachlor epoxide	ND		ug/l	0.014	--	1	A
Endrin	ND		ug/l	0.029	--	1	A
Endrin aldehyde	ND		ug/l	0.029	--	1	A
Endrin ketone	ND		ug/l	0.029	--	1	A
Dieldrin	ND		ug/l	0.029	--	1	A
4,4'-DDE	ND		ug/l	0.029	--	1	A
4,4'-DDD	ND		ug/l	0.029	--	1	A
4,4'-DDT	ND		ug/l	0.029	--	1	A
Endosulfan I	ND		ug/l	0.014	--	1	A
Endosulfan II	ND		ug/l	0.029	--	1	A
Endosulfan sulfate	ND		ug/l	0.029	--	1	A
Methoxychlor	ND		ug/l	0.143	--	1	A
Toxaphene	ND		ug/l	0.143	--	1	A
Chlordane	ND		ug/l	0.143	--	1	A
cis-Chlordane	ND		ug/l	0.014	--	1	A
trans-Chlordane	ND		ug/l	0.014	--	1	A

Project Name: MOOT MACHIAS LF **Lab Number:** L2244025

Project Number: 130749 **Report Date:** 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03 Date Collected: 08/15/22 13:30

Client ID: HA22-9(OW) Date Received: 08/16/22

Sample Location: MACHIAS, ME Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Pesticides by GC - Westborough Lab							

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	80		30-150	A
Decachlorobiphenyl	80		30-150	A
2,4,5,6-Tetrachloro-m-xylene	80		30-150	B
Decachlorobiphenyl	87		30-150	B

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8151A
Analytical Date: 08/20/22 23:20
Analyst: EJL

Extraction Method: EPA 8151A
Extraction Date: 08/19/22 14:02

Methylation Date: 08/20/22 09:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Chlorinated Herbicides by GC - Westborough Lab							
MCPP	ND		ug/l	500	--	1	A
MCPA	ND		ug/l	500	--	1	A
Dalapon	ND		ug/l	20.0	--	1	A
Dicamba	ND		ug/l	1.00	--	1	A
Dichloroprop	ND		ug/l	10.0	--	1	A
2,4-D	ND		ug/l	10.0	--	1	A
2,4-DB	ND		ug/l	10.0	--	1	A
2,4,5-T	ND		ug/l	2.00	--	1	A
2,4,5-TP (Silvex)	ND		ug/l	2.00	--	1	A
Dinoseb	ND		ug/l	5.00	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DCAA	118		30-150	A
DCAA	123		30-150	B

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8081B
Analytical Date: 08/22/22 13:33
Analyst: AKM

Extraction Method: EPA 3510C
Extraction Date: 08/21/22 17:30

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Pesticides by GC - Westborough Lab							
Delta-BHC	ND		ug/l	0.014	--	1	A
Lindane	ND		ug/l	0.014	--	1	A
Alpha-BHC	ND		ug/l	0.014	--	1	A
Beta-BHC	ND		ug/l	0.014	--	1	A
Heptachlor	ND		ug/l	0.014	--	1	A
Aldrin	ND		ug/l	0.014	--	1	A
Heptachlor epoxide	ND		ug/l	0.014	--	1	A
Endrin	ND		ug/l	0.029	--	1	A
Endrin aldehyde	ND		ug/l	0.029	--	1	A
Endrin ketone	ND		ug/l	0.029	--	1	A
Dieldrin	ND		ug/l	0.029	--	1	A
4,4'-DDE	ND		ug/l	0.029	--	1	A
4,4'-DDD	ND		ug/l	0.029	--	1	A
4,4'-DDT	ND		ug/l	0.029	--	1	A
Endosulfan I	ND		ug/l	0.014	--	1	A
Endosulfan II	ND		ug/l	0.029	--	1	A
Endosulfan sulfate	ND		ug/l	0.029	--	1	A
Methoxychlor	ND		ug/l	0.143	--	1	A
Toxaphene	ND		ug/l	0.143	--	1	A
Chlordane	ND		ug/l	0.143	--	1	A
cis-Chlordane	ND		ug/l	0.014	--	1	A
trans-Chlordane	ND		ug/l	0.014	--	1	A

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Pesticides by GC - Westborough Lab							

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	79		30-150	A
Decachlorobiphenyl	74		30-150	A
2,4,5,6-Tetrachloro-m-xylene	75		30-150	B
Decachlorobiphenyl	81		30-150	B

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME

Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water
Analytical Method: 1,8151A
Analytical Date: 08/20/22 23:38
Analyst: EJL

Extraction Method: EPA 8151A
Extraction Date: 08/19/22 14:02

Methylation Date: 08/20/22 09:59

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Column
Chlorinated Herbicides by GC - Westborough Lab							
MCPP	ND		ug/l	500	--	1	A
MCPA	ND		ug/l	500	--	1	A
Dalapon	ND		ug/l	20.0	--	1	A
Dicamba	ND		ug/l	1.00	--	1	A
Dichloroprop	ND		ug/l	10.0	--	1	A
2,4-D	ND		ug/l	10.0	--	1	A
2,4-DB	ND		ug/l	10.0	--	1	A
2,4,5-T	ND		ug/l	2.00	--	1	A
2,4,5-TP (Silvex)	ND		ug/l	2.00	--	1	A
Dinoseb	ND		ug/l	5.00	--	1	A

Surrogate	% Recovery	Qualifier	Acceptance Criteria	Column
DCAA	126		30-150	A
DCAA	122		30-150	B

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8151A
Analytical Date: 08/20/22 20:35
Analyst: EJL

Extraction Method: EPA 8151A
Extraction Date: 08/19/22 14:02

Methylation Date: 08/20/22 09:59

Parameter	Result	Qualifier	Units	RL	MDL	Column
Chlorinated Herbicides by GC - Westborough Lab for sample(s): 01-04 Batch: WG1677401-1						
MCPP	ND		ug/l	500	--	A
MCPA	ND		ug/l	500	--	A
Dalapon	ND		ug/l	20.0	--	A
Dicamba	ND		ug/l	1.00	--	A
Dichloroprop	ND		ug/l	10.0	--	A
2,4-D	ND		ug/l	10.0	--	A
2,4-DB	ND		ug/l	10.0	--	A
2,4,5-T	ND		ug/l	2.00	--	A
2,4,5-TP (Silvex)	ND		ug/l	2.00	--	A
Dinoseb	ND		ug/l	5.00	--	A

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
DCAA	116		30-150	A
DCAA	99		30-150	B

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 08/22/22 12:25
Analyst: AKM

Extraction Method: EPA 3510C
Extraction Date: 08/21/22 17:30

Parameter	Result	Qualifier	Units	RL	MDL	Column
Pesticides by GC - Westborough Lab for sample(s): 01-04 Batch: WG1677901-1						
Delta-BHC	ND		ug/l	0.014	--	A
Lindane	ND		ug/l	0.014	--	A
Alpha-BHC	ND		ug/l	0.014	--	A
Beta-BHC	ND		ug/l	0.014	--	A
Heptachlor	ND		ug/l	0.014	--	A
Aldrin	ND		ug/l	0.014	--	A
Heptachlor epoxide	ND		ug/l	0.014	--	A
Endrin	ND		ug/l	0.029	--	A
Endrin aldehyde	ND		ug/l	0.029	--	A
Endrin ketone	ND		ug/l	0.029	--	A
Dieldrin	ND		ug/l	0.029	--	A
4,4'-DDE	ND		ug/l	0.029	--	A
4,4'-DDD	ND		ug/l	0.029	--	A
4,4'-DDT	ND		ug/l	0.029	--	A
Endosulfan I	ND		ug/l	0.014	--	A
Endosulfan II	ND		ug/l	0.029	--	A
Endosulfan sulfate	ND		ug/l	0.029	--	A
Methoxychlor	ND		ug/l	0.143	--	A
Toxaphene	ND		ug/l	0.143	--	A
Chlordane	ND		ug/l	0.143	--	A
cis-Chlordane	ND		ug/l	0.014	--	A
trans-Chlordane	ND		ug/l	0.014	--	A

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Analytical Method: 1,8081B
Analytical Date: 08/22/22 12:25
Analyst: AKM

Extraction Method: EPA 3510C
Extraction Date: 08/21/22 17:30

Parameter	Result	Qualifier	Units	RL	MDL	Column
Pesticides by GC - Westborough Lab for sample(s): 01-04 Batch: WG1677901-1						

Surrogate	%Recovery	Qualifier	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	88		30-150	A
Decachlorobiphenyl	85		30-150	A
2,4,5,6-Tetrachloro-m-xylene	81		30-150	B
Decachlorobiphenyl	95		30-150	B

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Chlorinated Herbicides by GC - Westborough Lab Associated sample(s): 01-04 Batch: WG1677401-2 WG1677401-3									
MCPP	**318**	Q	**304**	Q	30-150	5		25	A
MCPA	**200**	Q	**190**	Q	30-150	5		25	A
Dalapon	117		108		30-150	8		25	A
Dicamba	106		99		30-150	7		25	A
Dichloroprop	130		123		30-150	6		25	A
2,4-D	120		112		30-150	7		25	A
2,4-DB	99		97		30-150	2		25	A
2,4,5-T	129		118		30-150	9		25	A
2,4,5-TP (Silvex)	114		107		30-150	6		25	A
Dinoseb	75		70		30-150	7		25	A

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
DCAA	126		118		30-150	A
DCAA	131		123		30-150	B

Lab Control Sample Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits	Column
Pesticides by GC - Westborough Lab Associated sample(s): 01-04 Batch: WG1677901-2 WG1677901-3									
Delta-BHC	65		67		30-150	3		20	A
Lindane	81		78		30-150	4		20	A
Alpha-BHC	84		81		30-150	4		20	A
Beta-BHC	78		74		30-150	6		20	A
Heptachlor	81		78		30-150	4		20	A
Aldrin	86		82		30-150	5		20	A
Heptachlor epoxide	83		80		30-150	5		20	A
Endrin	83		80		30-150	4		20	A
Endrin aldehyde	67		68		30-150	2		20	A
Endrin ketone	82		81		30-150	1		20	A
Dieldrin	96		92		30-150	4		20	A
4,4'-DDE	88		84		30-150	4		20	A
4,4'-DDD	93		88		30-150	6		20	A
4,4'-DDT	90		85		30-150	5		20	A
Endosulfan I	91		83		30-150	9		20	A
Endosulfan II	80		82		30-150	2		20	A
Endosulfan sulfate	74		76		30-150	3		20	A
Methoxychlor	92		86		30-150	7		20	A
cis-Chlordane	79		76		30-150	4		20	A
trans-Chlordane	108		101		30-150	7		20	A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Pesticides by GC - Westborough Lab Associated sample(s): 01-04 Batch: WG1677901-2 WG1677901-3								

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria	Column
2,4,5,6-Tetrachloro-m-xylene	77		80		30-150	A
Decachlorobiphenyl	79		75		30-150	A
2,4,5,6-Tetrachloro-m-xylene	72		76		30-150	B
Decachlorobiphenyl	88		87		30-150	B

METALS

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab											
Arsenic, Dissolved	ND		mg/l	0.005	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Barium, Dissolved	0.161		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Cadmium, Dissolved	ND		mg/l	0.005	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Calcium, Dissolved	122		mg/l	0.100	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Chromium, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Copper, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Iron, Dissolved	0.168		mg/l	0.050	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Lead, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Magnesium, Dissolved	77.6		mg/l	0.100	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Manganese, Dissolved	4.07		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Mercury, Dissolved	ND		mg/l	0.00020	--	1	08/17/22 17:24	08/21/22 16:17	EPA 7470A	1,7470A	AW
Potassium, Dissolved	14.5		mg/l	2.50	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Sodium, Dissolved	412		mg/l	2.00	--	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF
Dissolved Hardness by SM 2340B - Mansfield Lab											
Hardness	624		mg/l	0.660	NA	1	08/17/22 17:03	08/25/22 14:48	EPA 3005A	1,6010D	JF

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab											
Arsenic, Dissolved	ND		mg/l	0.005	--	1	08/17/22 17:03	08/25/22 14:33	EPA 3005A	1,6010D	JF
Barium, Dissolved	0.314		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:33	EPA 3005A	1,6010D	JF
Cadmium, Dissolved	ND		mg/l	0.005	--	1	08/17/22 17:03	08/25/22 14:33	EPA 3005A	1,6010D	JF
Calcium, Dissolved	165		mg/l	0.100	--	1	08/17/22 17:03	08/25/22 14:33	EPA 3005A	1,6010D	JF
Chromium, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:33	EPA 3005A	1,6010D	JF
Copper, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:33	EPA 3005A	1,6010D	JF
Iron, Dissolved	148		mg/l	0.050	--	1	08/17/22 17:03	08/25/22 14:33	EPA 3005A	1,6010D	JF
Lead, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:33	EPA 3005A	1,6010D	JF
Magnesium, Dissolved	65.0		mg/l	0.100	--	1	08/17/22 17:03	08/25/22 14:33	EPA 3005A	1,6010D	JF
Manganese, Dissolved	35.9		mg/l	0.100	--	10	08/17/22 17:03	08/25/22 15:40	EPA 3005A	1,6010D	JF
Mercury, Dissolved	ND		mg/l	0.00020	--	1	08/17/22 17:24	08/21/22 16:04	EPA 7470A	1,7470A	AW
Potassium, Dissolved	9.42		mg/l	2.50	--	1	08/17/22 17:03	08/25/22 14:33	EPA 3005A	1,6010D	JF
Sodium, Dissolved	1870		mg/l	20.0	--	10	08/17/22 17:03	08/25/22 15:40	EPA 3005A	1,6010D	JF
Dissolved Hardness by SM 2340B - Mansfield Lab											
Hardness	680		mg/l	0.660	NA	1	08/17/22 17:03	08/25/22 14:33	EPA 3005A	1,6010D	JF

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab											
Arsenic, Dissolved	ND		mg/l	0.005	--	1	08/17/22 17:03	08/25/22 14:37	EPA 3005A	1,6010D	JF
Barium, Dissolved	0.739		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:37	EPA 3005A	1,6010D	JF
Cadmium, Dissolved	0.005		mg/l	0.005	--	1	08/17/22 17:03	08/25/22 14:37	EPA 3005A	1,6010D	JF
Calcium, Dissolved	478		mg/l	0.100	--	1	08/17/22 17:03	08/25/22 14:37	EPA 3005A	1,6010D	JF
Chromium, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:37	EPA 3005A	1,6010D	JF
Copper, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:37	EPA 3005A	1,6010D	JF
Iron, Dissolved	5.65		mg/l	0.050	--	1	08/17/22 17:03	08/25/22 14:37	EPA 3005A	1,6010D	JF
Lead, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:37	EPA 3005A	1,6010D	JF
Magnesium, Dissolved	198		mg/l	0.100	--	1	08/17/22 17:03	08/25/22 14:37	EPA 3005A	1,6010D	JF
Manganese, Dissolved	39.6		mg/l	0.100	--	10	08/17/22 17:03	08/25/22 15:45	EPA 3005A	1,6010D	JF
Mercury, Dissolved	ND		mg/l	0.00020	--	1	08/17/22 17:24	08/21/22 16:49	EPA 7470A	1,7470A	AW
Potassium, Dissolved	29.3		mg/l	2.50	--	1	08/17/22 17:03	08/25/22 14:37	EPA 3005A	1,6010D	JF
Sodium, Dissolved	2380		mg/l	20.0	--	10	08/17/22 17:03	08/25/22 15:45	EPA 3005A	1,6010D	JF
Dissolved Hardness by SM 2340B - Mansfield Lab											
Hardness	2010		mg/l	0.660	NA	1	08/17/22 17:03	08/25/22 14:37	EPA 3005A	1,6010D	JF

Project Name: MOOT MACHIAS LF
Lab Number: L2244025
Project Number: 130749
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME
Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Sample Depth:
Matrix: Water

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Prep Method	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab											
Arsenic, Dissolved	ND		mg/l	0.005	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Barium, Dissolved	2.18		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Cadmium, Dissolved	ND		mg/l	0.005	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Calcium, Dissolved	98.3		mg/l	0.100	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Chromium, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Copper, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Iron, Dissolved	96.6		mg/l	0.050	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Lead, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Magnesium, Dissolved	21.7		mg/l	0.100	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Manganese, Dissolved	0.396		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Mercury, Dissolved	ND		mg/l	0.00020	--	1	08/17/22 17:24	08/21/22 16:53	EPA 7470A	1,7470A	AW
Potassium, Dissolved	25.6		mg/l	2.50	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Sodium, Dissolved	500		mg/l	2.00	--	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF
Dissolved Hardness by SM 2340B - Mansfield Lab											
Hardness	335		mg/l	0.660	NA	1	08/17/22 17:03	08/25/22 14:43	EPA 3005A	1,6010D	JF

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-04 Batch: WG1676235-1										
Arsenic, Dissolved	ND		mg/l	0.005	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF
Barium, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF
Cadmium, Dissolved	ND		mg/l	0.005	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF
Calcium, Dissolved	ND		mg/l	0.100	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF
Chromium, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF
Copper, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF
Iron, Dissolved	ND		mg/l	0.050	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF
Lead, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF
Magnesium, Dissolved	ND		mg/l	0.100	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF
Manganese, Dissolved	ND		mg/l	0.010	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF
Potassium, Dissolved	ND		mg/l	2.50	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF
Sodium, Dissolved	ND		mg/l	2.00	--	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Hardness by SM 2340B - Mansfield Lab for sample(s): 01-04 Batch: WG1676235-1										
Hardness	ND		mg/l	0.660	NA	1	08/17/22 17:03	08/25/22 14:23	1,6010D	JF

Prep Information

Digestion Method: EPA 3005A

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
Dissolved Metals - Mansfield Lab for sample(s): 01-04 Batch: WG1676237-1										
Mercury, Dissolved	ND		mg/l	0.00020	--	1	08/17/22 17:24	08/21/22 15:57	1,7470A	AW

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Prep Information

Digestion Method: EPA 7470A

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-04 Batch: WG1676235-2								
Arsenic, Dissolved	102		-		80-120	-		
Barium, Dissolved	97		-		80-120	-		
Cadmium, Dissolved	96		-		80-120	-		
Calcium, Dissolved	99		-		80-120	-		
Chromium, Dissolved	94		-		80-120	-		
Copper, Dissolved	98		-		80-120	-		
Iron, Dissolved	98		-		80-120	-		
Lead, Dissolved	98		-		80-120	-		
Magnesium, Dissolved	103		-		80-120	-		
Manganese, Dissolved	95		-		80-120	-		
Potassium, Dissolved	101		-		80-120	-		
Sodium, Dissolved	94		-		80-120	-		
Dissolved Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-04 Batch: WG1676235-2								
Hardness	102		-		80-120	-		
Dissolved Metals - Mansfield Lab Associated sample(s): 01-04 Batch: WG1676237-2								
Mercury, Dissolved	107		-		80-120	-		

Matrix Spike Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676235-3 QC Sample: L2244025-01 Client ID: HA22-2(OW)												
Arsenic, Dissolved	ND	0.12	0.128	107		-	-		75-125	-		20
Barium, Dissolved	0.161	2	2.03	93		-	-		75-125	-		20
Cadmium, Dissolved	ND	0.053	0.049	92		-	-		75-125	-		20
Calcium, Dissolved	122	10	130	80		-	-		75-125	-		20
Chromium, Dissolved	ND	0.2	0.180	90		-	-		75-125	-		20
Copper, Dissolved	ND	0.25	0.252	101		-	-		75-125	-		20
Iron, Dissolved	0.168	1	0.995	83		-	-		75-125	-		20
Lead, Dissolved	ND	0.53	0.490	92		-	-		75-125	-		20
Magnesium, Dissolved	77.6	10	88.3	107		-	-		75-125	-		20
Manganese, Dissolved	4.07	0.5	4.45	76		-	-		75-125	-		20
Potassium, Dissolved	14.5	10	25.2	107		-	-		75-125	-		20
Sodium, Dissolved	412	10	421	90		-	-		75-125	-		20
Dissolved Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676235-3 QC Sample: L2244025-01 Client ID: HA22-2(OW)												
Hardness	624	66.2	687	95		-	-		75-125	-		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676237-3 QC Sample: L2244025-02 Client ID: HA22-8(OW)												
Mercury, Dissolved	ND	0.005	0.00511	102		-	-		75-125	-		20

Lab Duplicate Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Dissolved Metals - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676235-4 QC Sample: L2244025-01 Client ID: HA22-2(OW)						
Arsenic, Dissolved	ND	ND	mg/l	NC		20
Barium, Dissolved	0.161	0.155	mg/l	4		20
Cadmium, Dissolved	ND	ND	mg/l	NC		20
Calcium, Dissolved	122	119	mg/l	2		20
Chromium, Dissolved	ND	ND	mg/l	NC		20
Copper, Dissolved	ND	ND	mg/l	NC		20
Iron, Dissolved	0.168	ND	mg/l	NC		20
Lead, Dissolved	ND	ND	mg/l	NC		20
Magnesium, Dissolved	77.6	77.0	mg/l	1		20
Manganese, Dissolved	4.07	3.97	mg/l	2		20
Potassium, Dissolved	14.5	14.0	mg/l	4		20
Sodium, Dissolved	412	400	mg/l	3		20
Dissolved Hardness by SM 2340B - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676235-4 QC Sample: L2244025-01 Client ID: HA22-2(OW)						
Hardness	624	614	mg/l	2		20
Dissolved Metals - Mansfield Lab Associated sample(s): 01-04 QC Batch ID: WG1676237-4 QC Sample: L2244025-02 Client ID: HA22-8(OW)						
Mercury, Dissolved	ND	ND	mg/l	NC		20

INORGANICS
&
MISCELLANEOUS

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-01
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME
Sample Depth:
Matrix: Water

Date Collected: 08/15/22 14:40
Date Received: 08/16/22
Field Prep: Refer to COC

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Total	405.		mg CaCO3/L	2.00	NA	1	-	08/22/22 08:44	121,2320B	MT
Alkalinity, Bicarbonate	405.		mg CaCO3/L	2.00	NA	1	-	08/22/22 08:44	121,2320B	MT
Nitrogen, Ammonia	0.803		mg/l	0.075	--	1	08/22/22 13:50	08/22/22 20:10	121,4500NH3-BH	AT
Chemical Oxygen Demand	47.		mg/l	20	--	1	08/17/22 09:00	08/17/22 12:08	121,5220D	CN
Total Organic Carbon	3.31		mg/l	1.00	--	2	-	08/17/22 10:01	121,5310C	DW
Anions by Ion Chromatography - Westborough Lab										
Bromide	1.83		mg/l	0.050	--	1	-	08/19/22 17:13	44,300.0	AT

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-02
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME
Sample Depth:
Matrix: Water

Date Collected: 08/15/22 12:00
Date Received: 08/16/22
Field Prep: Refer to COC

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Total	64.2		mg CaCO3/L	2.00	NA	1	-	08/22/22 08:44	121,2320B	MT
Alkalinity, Bicarbonate	64.2		mg CaCO3/L	2.00	NA	1	-	08/22/22 08:44	121,2320B	MT
Nitrogen, Ammonia	5.89		mg/l	0.075	--	1	08/22/22 13:50	08/22/22 20:13	121,4500NH3-BH	AT
Chemical Oxygen Demand	250		mg/l	20	--	1	08/17/22 09:00	08/17/22 12:08	121,5220D	CN
Total Organic Carbon	4.14		mg/l	2.00	--	4	-	08/17/22 10:23	121,5310C	DW
Anions by Ion Chromatography - Westborough Lab										
Bromide	9.39		mg/l	1.25	--	25	-	08/19/22 21:02	44,300.0	AT

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-03
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME
Sample Depth:
Matrix: Water
Date Collected: 08/15/22 13:30
Date Received: 08/16/22
Field Prep: Refer to COC

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Total	380.		mg CaCO3/L	2.00	NA	1	-	08/22/22 08:44	121,2320B	MT
Alkalinity, Bicarbonate	380.		mg CaCO3/L	2.00	NA	1	-	08/22/22 08:44	121,2320B	MT
Nitrogen, Ammonia	0.150		mg/l	0.075	--	1	08/22/22 13:50	08/22/22 20:17	121,4500NH3-BH	AT
Chemical Oxygen Demand	370		mg/l	20	--	1	08/17/22 09:00	08/17/22 12:16	121,5220D	CN
Total Organic Carbon	3.62		mg/l	2.00	--	4	-	08/17/22 12:08	121,5310C	DW
Anions by Ion Chromatography - Westborough Lab										
Bromide	6.06		mg/l	2.50	--	50	-	08/19/22 20:51	44,300.0	AT

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-04
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME
Sample Depth:
Matrix: Water
Date Collected: 08/15/22 16:00
Date Received: 08/16/22
Field Prep: Refer to COC

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Alkalinity, Total	318.		mg CaCO3/L	2.00	NA	1	-	08/22/22 08:44	121,2320B	MT
Alkalinity, Bicarbonate	318.		mg CaCO3/L	2.00	NA	1	-	08/22/22 08:44	121,2320B	MT
Nitrogen, Ammonia	8.95		mg/l	0.075	--	1	08/22/22 13:50	08/22/22 20:18	121,4500NH3-BH	AT
Chemical Oxygen Demand	64.		mg/l	20	--	1	08/17/22 09:00	08/17/22 12:16	121,5220D	CN
Total Organic Carbon	4.53		mg/l	1.00	--	2	-	08/17/22 11:06	121,5310C	DW
Anions by Ion Chromatography - Westborough Lab										
Bromide	4.78		mg/l	1.25	--	25	-	08/19/22 21:35	44,300.0	AT

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-05
Client ID: HA22-2(OW)
Sample Location: MACHIAS, ME
Sample Depth:
Matrix: Water

Date Collected: 08/16/22 08:00
Date Received: 08/16/22
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	1700		mg/l	10	--	1	-	08/17/22 09:10	121,2540C	DW
Nitrogen, Nitrite	ND		mg/l	0.050	--	1	-	08/17/22 05:36	44,353.2	KA
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/17/22 06:05	08/17/22 06:19	1,7196A	KA
Anions by Ion Chromatography - Westborough Lab										
Chloride	838.		mg/l	12.5	--	25	-	08/17/22 20:35	44,300.0	AT
Nitrogen, Nitrate	ND		mg/l	0.050	--	1	-	08/17/22 16:57	44,300.0	AT
Sulfate	26.8		mg/l	1.00	--	1	-	08/17/22 16:57	44,300.0	AT

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-06
Client ID: HA22-8(OW)
Sample Location: MACHIAS, ME
Sample Depth:
Matrix: Water

Date Collected: 08/16/22 07:20
Date Received: 08/16/22
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	5500		mg/l	20	--	2	-	08/17/22 09:10	121,2540C	DW
Nitrogen, Nitrite	0.057		mg/l	0.050	--	1	-	08/17/22 05:44	44,353.2	KA
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/17/22 06:05	08/17/22 06:19	1,7196A	KA
Anions by Ion Chromatography - Westborough Lab										
Chloride	3250		mg/l	250	--	500	-	08/17/22 20:46	44,300.0	AT
Nitrogen, Nitrate	0.537		mg/l	0.050	--	1	-	08/17/22 17:08	44,300.0	AT
Sulfate	ND		mg/l	1.00	--	1	-	08/17/22 17:08	44,300.0	AT

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-07
Client ID: HA22-9(OW)
Sample Location: MACHIAS, ME
Sample Depth:
Matrix: Water
Date Collected: 08/16/22 07:40
Date Received: 08/16/22
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	7200		mg/l	20	--	2	-	08/17/22 09:10	121,2540C	DW
Nitrogen, Nitrite	ND		mg/l	0.050	--	1	-	08/17/22 05:45	44,353.2	KA
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/17/22 06:05	08/17/22 06:20	1,7196A	KA
Anions by Ion Chromatography - Westborough Lab										
Chloride	4190		mg/l	250	--	500	-	08/17/22 20:57	44,300.0	AT
Nitrogen, Nitrate	0.166		mg/l	0.050	--	1	-	08/17/22 17:19	44,300.0	AT
Sulfate	24.7		mg/l	1.00	--	1	-	08/17/22 17:19	44,300.0	AT

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

SAMPLE RESULTS

Lab ID: L2244025-08
Client ID: HA22-10(OW)
Sample Location: MACHIAS, ME
Sample Depth:
Matrix: Water
Date Collected: 08/16/22 07:50
Date Received: 08/16/22
Field Prep: Not Specified

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab										
Solids, Total Dissolved	1800		mg/l	20	--	2	-	08/17/22 09:10	121,2540C	DW
Nitrogen, Nitrite	0.050		mg/l	0.050	--	1	-	08/17/22 05:47	44,353.2	KA
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/17/22 06:05	08/17/22 06:20	1,7196A	KA
Anions by Ion Chromatography - Westborough Lab										
Chloride	859.		mg/l	12.5	--	25	-	08/17/22 20:02	44,300.0	AT
Nitrogen, Nitrate	ND		mg/l	0.050	--	1	-	08/17/22 17:30	44,300.0	AT
Sulfate	1.07		mg/l	1.00	--	1	-	08/17/22 17:30	44,300.0	AT

Project Name: MOOT MACHIAS LF
Project Number: 130749
Lab Number: L2244025
Report Date: 08/25/22

Method Blank Analysis
Batch Quality Control

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Analytical Method	Analyst
General Chemistry - Westborough Lab for sample(s): 05-08 Batch: WG1676050-1										
Nitrogen, Nitrite	ND		mg/l	0.050	--	1	-	08/17/22 03:21	44,353.2	KA
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1676086-1										
Total Organic Carbon	ND		mg/l	0.500	--	1	-	08/17/22 05:15	121,5310C	DW
General Chemistry - Westborough Lab for sample(s): 05-08 Batch: WG1676114-1										
Chromium, Hexavalent	ND		mg/l	0.010	--	1	08/17/22 06:05	08/17/22 06:18	1,7196A	KA
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1676163-1										
Chemical Oxygen Demand	ND		mg/l	20	--	1	08/17/22 09:00	08/17/22 12:05	121,5220D	CN
General Chemistry - Westborough Lab for sample(s): 05-08 Batch: WG1676175-1										
Solids, Total Dissolved	ND		mg/l	10	--	1	-	08/17/22 09:10	121,2540C	DW
Anions by Ion Chromatography - Westborough Lab for sample(s): 05-08 Batch: WG1676555-1										
Chloride	ND		mg/l	0.500	--	1	-	08/17/22 16:35	44,300.0	AT
Nitrogen, Nitrate	ND		mg/l	0.050	--	1	-	08/17/22 16:35	44,300.0	AT
Sulfate	ND		mg/l	1.00	--	1	-	08/17/22 16:35	44,300.0	AT
Anions by Ion Chromatography - Westborough Lab for sample(s): 01-04 Batch: WG1677498-1										
Bromide	ND		mg/l	0.050	--	1	-	08/19/22 16:51	44,300.0	AT
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1678011-1										
Alkalinity, Total	ND		mg CaCO3/L	2.00	NA	1	-	08/22/22 08:44	121,2320B	MT
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1678013-1										
Alkalinity, Bicarbonate	ND		mg CaCO3/L	2.00	NA	1	-	08/22/22 08:44	121,2320B	MT
General Chemistry - Westborough Lab for sample(s): 01-04 Batch: WG1678048-1										
Nitrogen, Ammonia	ND		mg/l	0.075	--	1	08/22/22 13:50	08/22/22 20:05	121,4500NH3-BH	AT

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 05-08 Batch: WG1676050-2								
Nitrogen, Nitrite	94		-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1676086-2								
Total Organic Carbon	98		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 05-08 Batch: WG1676114-2								
Chromium, Hexavalent	102		-		85-115	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1676163-2								
Chemical Oxygen Demand	100		-		90-110	-		
General Chemistry - Westborough Lab Associated sample(s): 05-08 Batch: WG1676175-2								
Solids, Total Dissolved	100		-		80-120	-		
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 05-08 Batch: WG1676555-2								
Chloride	104		-		90-110	-		
Nitrogen, Nitrate	92		-		90-110	-		
Sulfate	103		-		90-110	-		

Lab Control Sample Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	LCS %Recovery	LCSD %Recovery	%Recovery Limits	RPD	RPD Limits
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-04 Batch: WG1677498-2					
Bromide	109	-	90-110	-	
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1678011-2					
Alkalinity, Total	108	-	90-110	-	10
General Chemistry - Westborough Lab Associated sample(s): 01-04 Batch: WG1678048-2					
Nitrogen, Ammonia	90	-	80-120	-	20

Matrix Spike Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Parameter	Native Sample	MS Added	MS Found	MS %Recovery	Qual	MSD Found	MSD %Recovery	Qual	Recovery Limits	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 05-08 QC Batch ID: WG1676050-4 QC Sample: L2244025-05 Client ID: HA22-2(OW)												
Nitrogen, Nitrite	ND	4	3.9	98		-	-		80-120	-		20
General Chemistry - Westborough Lab Associated sample(s): 05-08 QC Batch ID: WG1676114-4 QC Sample: L2244025-06 Client ID: HA22-8(OW)												
Chromium, Hexavalent	ND	0.1	0.098	98		-	-		85-115	-		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 05-08 QC Batch ID: WG1676555-3 QC Sample: L2244025-08 Client ID: HA22-10(OW)												
Chloride	859	100	981	**122**	Q	-	-		90-110	-		18
Nitrogen, Nitrate	ND	0.4	0.292	**75**	Q	-	-		90-110	-		15
Sulfate	1.07	8	8.00	**81**	Q	-	-		90-110	-		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1677498-3 QC Sample: L2244025-04 Client ID: HA22-10(OW)												
Bromide	4.78	10	17.5	**128**	Q	-	-		90-110	-		20
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1678011-4 QC Sample: L2244025-04 Client ID: HA22-10(OW)												
Alkalinity, Total	318	100	367	**49**	Q	-	-		86-116	-		10
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1678048-4 QC Sample: L2244025-01 Client ID: HA22-2(OW)												
Nitrogen, Ammonia	0.803	4	4.64	96		-	-		80-120	-		20

Lab Duplicate Analysis
Batch Quality Control

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 05-08 QC Batch ID: WG1676050-3 QC Sample: L2244025-05 Client ID: HA22-2(OW)						
Nitrogen, Nitrite	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 05-08 QC Batch ID: WG1676114-3 QC Sample: L2244025-05 Client ID: HA22-2(OW)						
Chromium, Hexavalent	ND	ND	mg/l	NC		20
General Chemistry - Westborough Lab Associated sample(s): 05-08 QC Batch ID: WG1676175-3 QC Sample: L2244025-05 Client ID: HA22-2(OW)						
Solids, Total Dissolved	1700	1700	mg/l	0		10
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 05-08 QC Batch ID: WG1676555-4 QC Sample: L2244025-08 Client ID: HA22-10(OW)						
Nitrogen, Nitrate	ND	ND	mg/l	NC		15
Sulfate	1.07	ND	mg/l	NC		20
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 05-08 QC Batch ID: WG1676555-4 QC Sample: L2244025-08 Client ID: HA22-10(OW)						
Chloride	859	867	mg/l	1		18
Anions by Ion Chromatography - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1677498-4 QC Sample: L2244025-04 Client ID: HA22-10(OW)						
Bromide	4.78	4.77	mg/l	0		20
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1678011-3 QC Sample: L2244025-04 Client ID: HA22-10(OW)						
Alkalinity, Total	318	317	mg CaCO3/L	0		10
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1678013-2 QC Sample: L2244025-04 Client ID: HA22-10(OW)						
Alkalinity, Bicarbonate	318	317	mg CaCO3/L	0		9

Lab Duplicate Analysis

Batch Quality Control

Project Name: MOOT MACHIAS LF

Project Number: 130749

Lab Number: L2244025

Report Date: 08/25/22

Parameter	Native Sample	Duplicate Sample	Units	RPD	RPD Limits
General Chemistry - Westborough Lab Associated sample(s): 01-04 QC Batch ID: WG1678048-3 QC Sample: L2244025-01 Client ID: HA22-2(OW)					
Nitrogen, Ammonia	0.803	0.846	mg/l	5	20

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Sample Receipt and Container Information

Were project specific reporting limits specified? YES

Cooler Information

Cooler	Custody Seal
A	Absent
B	Absent
C	Absent
D	Absent
E	Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2244025-01A	Plastic 250ml unpreserved	C	NA		2.9	Y	Absent		ME-8260(7),BR-300(28)
L2244025-01B	Vial HCl preserved	C	NA		2.9	Y	Absent		ME-8260(7)
L2244025-01C	Vial HCl preserved	C	NA		2.9	Y	Absent		ME-8260(7)
L2244025-01D	Vial H2SO4 preserved	C	NA		2.9	Y	Absent		TOC-5310(28)
L2244025-01E	Vial H2SO4 preserved	C	NA		2.9	Y	Absent		TOC-5310(28)
L2244025-01F	20ml Vial HCl preserved	C	NA		2.9	Y	Absent		DISSGAS(14)
L2244025-01G	20ml Vial HCl preserved	A	NA		2.8	Y	Absent		DISSGAS(14)
L2244025-01H	Plastic 250ml unpreserved	A	NA		2.8	Y	Absent		A2-ME-537ISOTOPE-28+(14)
L2244025-01I	Plastic 250ml unpreserved	C	NA		2.9	Y	Absent		A2-ME-537ISOTOPE-28+(14)
L2244025-01J	Plastic 250ml unpreserved/No Headspace	C	NA		2.9	Y	Absent		ALK-T-2320(14),ALK-HCO3-2320(14)
L2244025-01K	Plastic 250ml HNO3 preserved	C	<2	<2	2.9	Y	Absent		PB-SI(180),FE-SI(180),BA-SI(180),AS-SI(180),CU-SI(180),NA-SI(180),MN-SI(180),CD-SI(180),HARDS(180),K-SI(180),MG-SI(180),CR-SI(180),CA-SI(180),HG-S(28)
L2244025-01L	Amber 120ml unpreserved	C	7	7	2.9	Y	Absent		PEST-8081(7)
L2244025-01M	Amber 120ml unpreserved	C	7	7	2.9	Y	Absent		PEST-8081(7)
L2244025-01N	Amber 250ml unpreserved	C	7	7	2.9	Y	Absent		8270TCL-LVI(7),8270TCL-SIM-LVI(7)
L2244025-01O	Amber 250ml unpreserved	C	7	7	2.9	Y	Absent		8270TCL-LVI(7),8270TCL-SIM-LVI(7)
L2244025-01P	Plastic 500ml H2SO4 preserved	C	<2	<2	2.9	Y	Absent		COD-5220(28),NH3-4500(28)
L2244025-01Q	Amber 1000ml unpreserved	C	7	7	2.9	Y	Absent		HERB-8151(7)

*Values in parentheses indicate holding time in days

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2244025-01R	Amber 1000ml unpreserved	C	7	7	2.9	Y	Absent		HERB-8151(7)
L2244025-02A	Plastic 250ml unpreserved	B	NA		2.8	Y	Absent		ME-8260(7),BR-300(28)
L2244025-02B	Vial HCl preserved	B	NA		2.8	Y	Absent		ME-8260(7)
L2244025-02C	Vial HCl preserved	B	NA		2.8	Y	Absent		ME-8260(7)
L2244025-02D	Vial H2SO4 preserved	B	NA		2.8	Y	Absent		TOC-5310(28)
L2244025-02E	Vial H2SO4 preserved	B	NA		2.8	Y	Absent		TOC-5310(28)
L2244025-02F	20ml Vial HCl preserved	B	NA		2.8	Y	Absent		DISSGAS(14)
L2244025-02G	20ml Vial HCl preserved	A	NA		2.8	Y	Absent		DISSGAS(14)
L2244025-02H	Plastic 250ml unpreserved	A	NA		2.8	Y	Absent		A2-ME-537ISOTOPE-28+(14)
L2244025-02I	Plastic 250ml unpreserved	B	NA		2.8	Y	Absent		A2-ME-537ISOTOPE-28+(14)
L2244025-02J	Plastic 250ml unpreserved/No Headspace	B	NA		2.8	Y	Absent		ALK-T-2320(14),ALK-HCO3-2320(14)
L2244025-02K	Plastic 250ml HNO3 preserved	B	<2	<2	2.8	Y	Absent		PB-SI(180),FE-SI(180),BA-SI(180),NA-SI(180),AS-SI(180),CU-SI(180),MN-SI(180),CD-SI(180),HARDS(180),K-SI(180),MG-SI(180),CR-SI(180),CA-SI(180),HG-S(28)
L2244025-02L	Amber 120ml unpreserved	B	7	7	2.8	Y	Absent		PEST-8081(7)
L2244025-02M	Amber 120ml unpreserved	B	7	7	2.8	Y	Absent		PEST-8081(7)
L2244025-02N	Amber 250ml unpreserved	B	7	7	2.8	Y	Absent		8270TCL-LVI(7),8270TCL-SIM-LVI(7)
L2244025-02O	Amber 250ml unpreserved	B	7	7	2.8	Y	Absent		8270TCL-LVI(7),8270TCL-SIM-LVI(7)
L2244025-02P	Plastic 500ml H2SO4 preserved	B	<2	<2	2.8	Y	Absent		COD-5220(28),NH3-4500(28)
L2244025-02Q	Amber 1000ml unpreserved	B	7	7	2.8	Y	Absent		HERB-8151(7)
L2244025-02R	Amber 1000ml unpreserved	B	7	7	2.8	Y	Absent		HERB-8151(7)
L2244025-03A	Plastic 250ml unpreserved	E	NA		2.8	Y	Absent		ME-8260(7),BR-300(28)
L2244025-03B	Vial HCl preserved	E	NA		2.8	Y	Absent		ME-8260(7)
L2244025-03C	Vial HCl preserved	E	NA		2.8	Y	Absent		ME-8260(7)
L2244025-03D	Vial H2SO4 preserved	E	NA		2.8	Y	Absent		TOC-5310(28)
L2244025-03E	Vial H2SO4 preserved	E	NA		2.8	Y	Absent		TOC-5310(28)
L2244025-03F	20ml Vial HCl preserved	E	NA		2.8	Y	Absent		DISSGAS(14)
L2244025-03G	20ml Vial HCl preserved	A	NA		2.8	Y	Absent		DISSGAS(14)

*Values in parentheses indicate holding time in days

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2244025-03H	Plastic 250ml unpreserved	A	NA		2.8	Y	Absent		A2-ME-537ISOTOPE-28+(14)
L2244025-03I	Plastic 250ml unpreserved	E	NA		2.8	Y	Absent		A2-ME-537ISOTOPE-28+(14)
L2244025-03J	Plastic 250ml unpreserved/No Headspace	E	NA		2.8	Y	Absent		ALK-T-2320(14),ALK-HCO3-2320(14)
L2244025-03K	Plastic 250ml HNO3 preserved	E	<2	<2	2.8	Y	Absent		PB-SI(180),FE-SI(180),BA-SI(180),NA-SI(180),AS-SI(180),MN-SI(180),CU-SI(180),CD-SI(180),HARDS(180),CR-SI(180),MG-SI(180),K-SI(180),HG-S(28),CA-SI(180)
L2244025-03L	Amber 120ml unpreserved	E	7	7	2.8	Y	Absent		PEST-8081(7)
L2244025-03M	Amber 120ml unpreserved	E	7	7	2.8	Y	Absent		PEST-8081(7)
L2244025-03N	Amber 250ml unpreserved	E	7	7	2.8	Y	Absent		8270TCL-LVI(7),8270TCL-SIM-LVI(7)
L2244025-03O	Amber 250ml unpreserved	E	7	7	2.8	Y	Absent		8270TCL-LVI(7),8270TCL-SIM-LVI(7)
L2244025-03P	Plastic 500ml H2SO4 preserved	E	<2	<2	2.8	Y	Absent		COD-5220(28),NH3-4500(28)
L2244025-03Q	Amber 1000ml unpreserved	E	7	7	2.8	Y	Absent		HERB-8151(7)
L2244025-03R	Amber 1000ml unpreserved	E	7	7	2.8	Y	Absent		HERB-8151(7)
L2244025-04A	Plastic 250ml unpreserved	D	NA		2.4	Y	Absent		ME-8260(7),BR-300(28)
L2244025-04B	Vial HCl preserved	D	NA		2.4	Y	Absent		ME-8260(7)
L2244025-04C	Vial HCl preserved	D	NA		2.4	Y	Absent		ME-8260(7)
L2244025-04D	Vial H2SO4 preserved	D	NA		2.4	Y	Absent		TOC-5310(28)
L2244025-04E	Vial H2SO4 preserved	D	NA		2.4	Y	Absent		TOC-5310(28)
L2244025-04F	20ml Vial HCl preserved	D	NA		2.4	Y	Absent		DISSGAS(14)
L2244025-04G	20ml Vial HCl preserved	A	NA		2.8	Y	Absent		DISSGAS(14)
L2244025-04H	Plastic 250ml unpreserved	A	NA		2.8	Y	Absent		A2-ME-537ISOTOPE-28+(14)
L2244025-04I	Plastic 250ml unpreserved	D	NA		2.4	Y	Absent		A2-ME-537ISOTOPE-28+(14)
L2244025-04J	Plastic 250ml unpreserved/No Headspace	D	NA		2.4	Y	Absent		ALK-T-2320(14),ALK-HCO3-2320(14)
L2244025-04K	Plastic 250ml HNO3 preserved	D	<2	<2	2.4	Y	Absent		PB-SI(180),FE-SI(180),BA-SI(180),MN-SI(180),CU-SI(180),NA-SI(180),AS-SI(180),CD-SI(180),HARDS(180),CR-SI(180),MG-SI(180),K-SI(180),CA-SI(180),HG-S(28)
L2244025-04L	Amber 120ml unpreserved	D	7	7	2.4	Y	Absent		PEST-8081(7)
L2244025-04M	Amber 120ml unpreserved	D	7	7	2.4	Y	Absent		PEST-8081(7)
L2244025-04N	Amber 250ml unpreserved	D	7	7	2.4	Y	Absent		8270TCL-LVI(7),8270TCL-SIM-LVI(7)

*Values in parentheses indicate holding time in days

Project Name: MOOT MACHIAS LF
Project Number: 130749

Lab Number: L2244025
Report Date: 08/25/22

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2244025-04O	Amber 250ml unpreserved	D	7	7	2.4	Y	Absent		8270TCL-LVI(7),8270TCL-SIM-LVI(7)
L2244025-04P	Plastic 500ml H2SO4 preserved	D	<2	<2	2.4	Y	Absent		COD-5220(28),NH3-4500(28)
L2244025-04Q	Amber 1000ml unpreserved	D	7	7	2.4	Y	Absent		HERB-8151(7)
L2244025-04R	Amber 1000ml unpreserved	D	7	7	2.4	Y	Absent		HERB-8151(7)
L2244025-05A	Plastic 950ml unpreserved	C	7	7	2.9	Y	Absent		SO4-300(28),HEXCR-7196(1),CL-300(28),NO2-353(2),NO3-300(2),TDS-2540(7)
L2244025-06A	Plastic 950ml unpreserved	B	7	7	2.8	Y	Absent		SO4-300(28),CL-300(28),HEXCR-7196(1),NO2-353(2),NO3-300(2),TDS-2540(7)
L2244025-07A	Plastic 950ml unpreserved	E	7	7	2.8	Y	Absent		SO4-300(28),HEXCR-7196(1),CL-300(28),NO3-300(2),NO2-353(2),TDS-2540(7)
L2244025-08A	Plastic 950ml unpreserved	D	7	7	2.4	Y	Absent		SO4-300(28),HEXCR-7196(1),CL-300(28),NO2-353(2),NO3-300(2),TDS-2540(7)
L2244025-09A	Plastic 250ml unpreserved	A	NA		2.8	Y	Absent		HOLD-537(14)

*Values in parentheses indicate holding time in days

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Project Number: 130749
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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	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	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
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	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:	MOOT MACHIAS LF	**Lab Number:**	L2244025
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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:	MOOT MACHIAS LF	**Lab Number:**	L2244025
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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

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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

Project Name:	MOOT MACHIAS LF	**Lab Number:**	L2244025
Project Number:	130749	**Report Date:**	08/25/22

REFERENCES

1 Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846. Third Edition. Updates I - VI, 2018.

44 Methods for the Determination of Inorganic Substances in Environmental Samples, EPA/600/R-93/100, August 1993.

117 Technical Guidance for the Natural Attenuation Indicators: Methane, Ethane, and Ethene, EPA-NE, Revision 1, February 21, 2002 and Sample Preparation & Calculations for Dissolved Gas Analysis in Water Samples using a GC Headspace Equilibration Technique, EPA RSKSOP-175, Revision 2, May 2004.

121 Standard Methods for the Examination of Water and Wastewater. APHA-AWWA-WEF. Standard Methods Online.

134 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) using Isotope Dilution. Alpha SOP 23528.

LIMITATION OF LIABILITIES

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

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

Certification Information

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

Westborough Facility
EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene
EPA 625/625.1: alpha-Terpineol
EPA 8260C/8260D: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.
EPA 8270D/8270E: NPW: Dimethylnaphthalene,1,4-Diphenylhydrazine, alpha-Terpineol; SCM: Dimethylnaphthalene,1,4-Diphenylhydrazine.
SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO2, NO3.

Mansfield Facility
SM 2540D: TSS
EPA 8082A: NPW: PCB: 1, 5, 31, 87,101, 110, 141, 151, 153, 180, 183, 187.
EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.
Biological Tissue Matrix: EPA 3050B

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

Westborough Facility:

Drinking Water
EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2**: Nitrate-N, Nitrite-N; **SM4500NO3-F**: Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500Cl-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**
EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.
Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT,SM9222D**.

Non-Potable Water
SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1**: Ammonia-N, **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), **EPA 600/4-81-045**: PCB-Oil.
Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603, SM9222D.**

Mansfield Facility:

Drinking Water
EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg.
EPA 522, EPA 537.1.

Non-Potable Water
EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.
EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.
EPA 245.1 Hg.
SM2340B

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

CHAIN OF CUSTODY

PAGE 1 OF 1

Date Rec'd in Lab: 8/16/22

ALPHA Job #: L2244025

ALPHA ANALYTICAL
8 Walkup Drive, Westboro, MA 01581, Tel: 508-898-9220
320 Forbes Blvd, Mansfield, MA 02048, Tel: 508-822-9300

Client Information

Client: Haley + Aldrich
Address: 75 Washington Ave, St #1, Portland, ME
Phone: 207-482-4606
Email: ddearden@haleyaldrich.com

Project Information

Project Name: MDOT Machias LF
Project Location: Machias, ME
Project #: 130749
Project Manager: D. Dearden
ALPHA Quote #:

Turn-Around Time

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

Report Information - Data Deliverables

☐ ADEx ☒ EMAIL

Billing Information

☐ Same as Client info PO #:

Regulatory Requirements & Project Information Requirements

☐ Yes ☐ No MA MCP Analytical Methods ☐ Yes ☐ No CT RCP Analytical Methods
☐ Yes ☐ No Matrix Spike Required on this SDG? (Required for MCP Inorganics)
☐ Yes ☐ No GW1 Standards (Info Required for Metals & EPH with Targets)
☐ Yes ☐ No NPDES RGP
☐ Other State /Fed Program Maine DEP Landfill Criteria Parameters

Additional Project Information:

Dissolved metals are field filtered.
HexCr, etc was not filtered.
Dissolved metals parameters - contact Melissa Gulli

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection Date	Collection Time	Sample Matrix	Sampler Initials	VOC: 8260 ☐ 624 ☐ 524.2	SVOC: ☐ ABN 8270 ☐ PAH 8270 TCL-SIM-LVL 8270	METALS: ☐ MCP 13 ☐ MCP 14 ☐ RCP 15	METALS: ☐ RCRA8 ☐ RCRA8 ☐ PP13 Dissolved	EPH: ☐ Ranges & Targets ☐ Ranges Only	VPH: ☐ Ranges & Targets ☐ Ranges Only	☐ PCB ☒ PEST, Herb 8151	TPH: ☐ Quant Only ☐ Fingerprint	NH_3, COD	TOC	Dissolved gas	Alk, 2320, HCO3	PFOAS by 537	HexCr, TDS, SO_4, Cl, ND, NO_2	Sample Comments	TOTAL # BOTTLES
44025 01	HA22-2(ow)	8/15/22	1440	gw	HMH	X	X	X			X			X	X	X	X	X			18
02	HA22-8(ow)	8/15/22	1200	gw	HMH	X	X	X			X			X	X	X	X	X		Some HNO_3 spilled out	18
03	HA22-9(ow)	8/15/22	1330	gw	HMH	X	X	X			X			X	X	X	X	X			18
04	HA22-10(ow)	8/15/22	1600	gw	HMH	X	X	X			X			X	X	X	X	X			18
05	HA22-2(ow)	8/16/22	0800	gw	HMH														X		1
06	HA22-8(ow)	8/16/22	0720	gw	HMH														X		1
07	HA22-9(ow)	8/16/22	0740	gw	HMH														X		1
08	HA22-10(ow)	8/16/22	0750	gw	HMH														X		1
Container Type						V	A	P			A			P	V	V	P	P	P		
Preservative						B	A	C			A			D	D	B	A	A	A		

SAMPLE INFO
Filtration: ☐ Field ☒ Lab to do
Preservation: ☐ Lab to do

Container Type
P= Plastic
A= Amber glass
V= Vial
G= Glass
B= Bacteria cup
C= Cube
O= Other
E= Encore
D= BOD Bottle

Preservative
A= None
B= HCl
C= HNO_3
D= H_2SO_4
E= NaOH
F= MeOH
G= $NaHSO_4$
H = $Na_2S_2O_3$
I= Ascorbic Acid
J = NH_4Cl
K= Zn Acetate
O= Other

Relinquished By:	Date/Time	Received By:	Date/Time
Melissa Gulli	8/16/22 1030	[illegible]	8/16/22 1030
[illegible] AAL	8/16/22 2100	[illegible] AAL	8/16/22 16:21
		[illegible]	8/16/22 21:00

All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

FORM NO: 01-01 (rev. 12-Mar-2012)

APPENDIX F
Geotechnical Design Calculations

HALEY ALDRICH	CALCULATIONS	File No.:	130749-009
		Sheet:	1 of 1
Client:	Maine Department of Transportation	Date:	18-Oct-2022
Project:	Machias Landfill, Dike Bridge Culvert Replacement	Computed by:	EMS
Subject:	Global Stability	Checked by:	EAF

PROBLEM STATEMENT AND OBJECTIVE

Calculate the global stability minimum factor of safety at the existing landfill.

REFERENCES

1. Slide2 version 9 by RocScience.

AVAILABLE INFORMATION

1. Topographic plan and cross sections AA' and BB' provided by MaineDOT.
2. Boring logs HA22-1, HA22-1B, HA22-2, and HA22-5 through HA22-10, and their associated observation wells.

ASSUMPTIONS

1. Water levels were modeled based on conditions observed in observation wells (OW-1 at AA' and BB' crest, OW-2 at AA' toe, and OW-9 at BB' toe).
2. High tide plus storm plus sea level rise water level (El. 14.7) was considered and had no effect on factors of safety.
3. Seismic cases will have a seismic force of As/2 (0.119 g/2) = 0.06 g based on the seismic site class calculations.
4. Soil properties were determined based on soil types and SPT N-values observed in the field.
5. The landfill waste and cover strata encountered both granular and cohesive soils. Cohesive properties were determined to be more conservative, therefore the landfill waste and cover is assumed to be cohesive in our final models.
6. Sections AA' and BB' were modeled to represent the "worst case scenario" steepest areas of the landfill slopes.

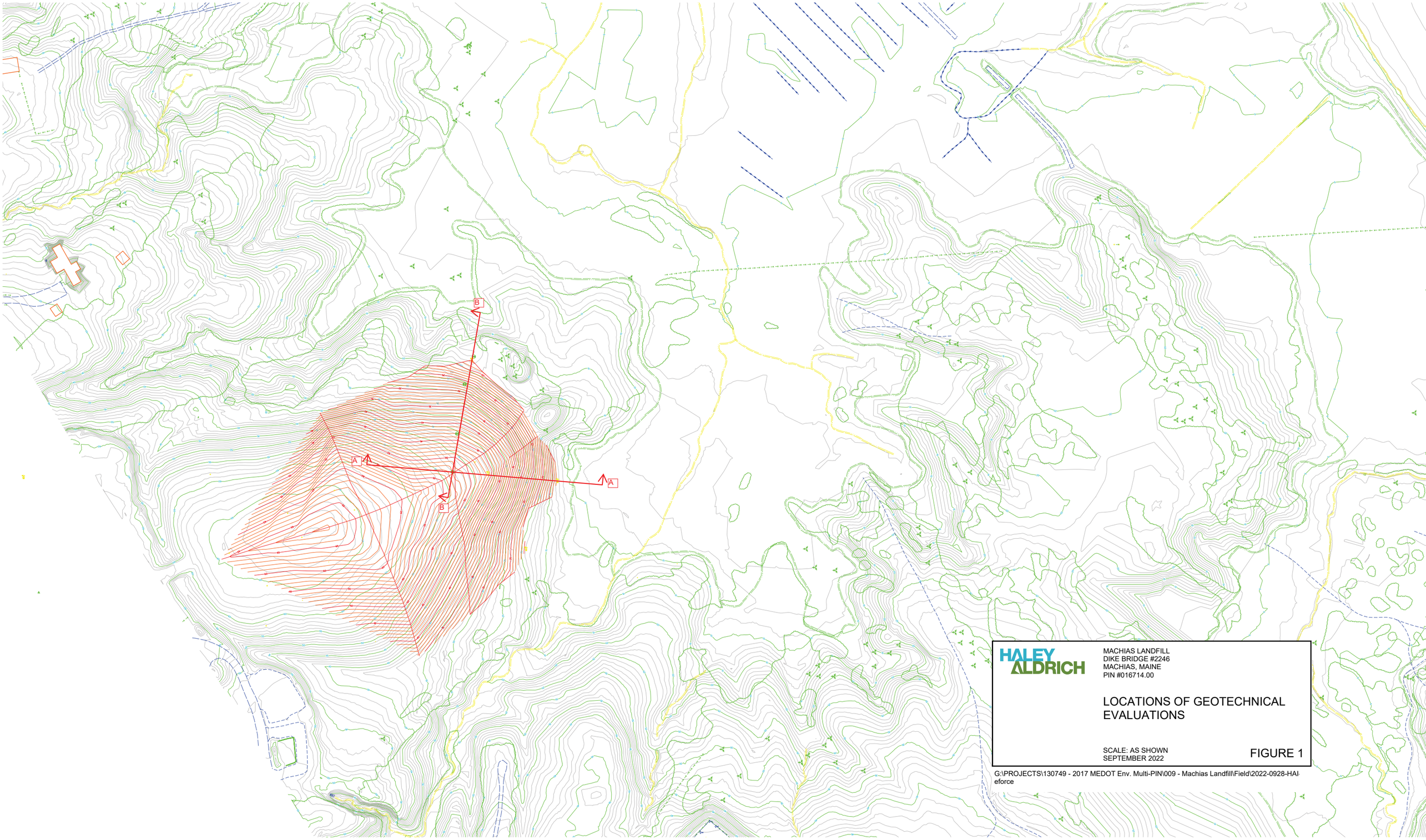
SOIL PROPERTIES

Material	Unit Weight (pcf)	Friction Angle (degrees)	Undrained Shear Strength (psf)
Clay Cap	120	-	775
Landfill Waste and Cover	120	28	550
Marine Deposit (reworked)	120	-	3000
Marine Deposit (natural)	120	-	1500
Fluvial	120	35	-
Glacial Till	130	38	-
Bedrock	130	infinite strength	

RESULTS AND CONCLUSIONS

Section	Landfill Waste and Cover Properties	F.S.	
		Static	Seismic
SE Landfill Section A-A (Current Groundwater Level; El. 12.1)	cohesive	1.53	1.24
SE Landfill Section A-A (Current Groundwater Level; El. 12.1)	cohesionless	2.04	1.66
SE Landfill Section A-A (Future High Tide/Storm/SLR; El. 14.7)	cohesive	1.53	1.24
NE Landfill Section B-B (Current Groundwater Level; El. 11.0)	cohesive	1.86	1.36
NE Landfill Section B-B (Future High Tide/Storm/SLR; El. 14.7)	cohesive	1.86	1.36

Based on AASHTO LRFD Section 11.6.3.7, an acceptable resistance factor for where the geotechnical parameters and subsurface stratigraphy are well defined is 0.75 (F.S. = 1/0.75 = 1.3).
Based on FHWA GEC No. 3, a minimum seismic factor of safety of 1.1 is acceptable for slope stability.



HALEY ALDRICH

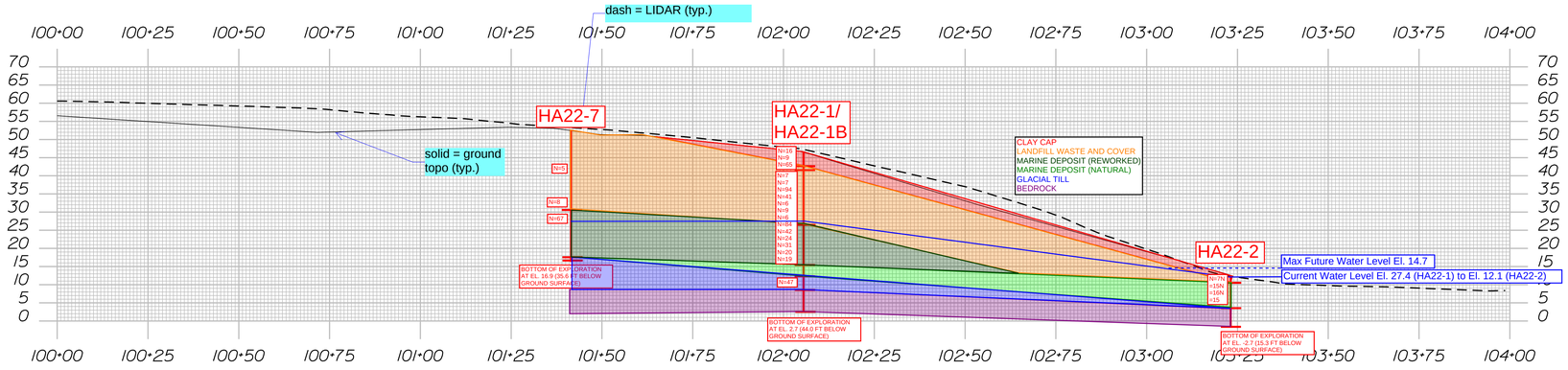
MACHIAS LANDFILL
DIKE BRIDGE #2246
MACHIAS, MAINE
PIN #016714.00

LOCATIONS OF GEOTECHNICAL EVALUATIONS

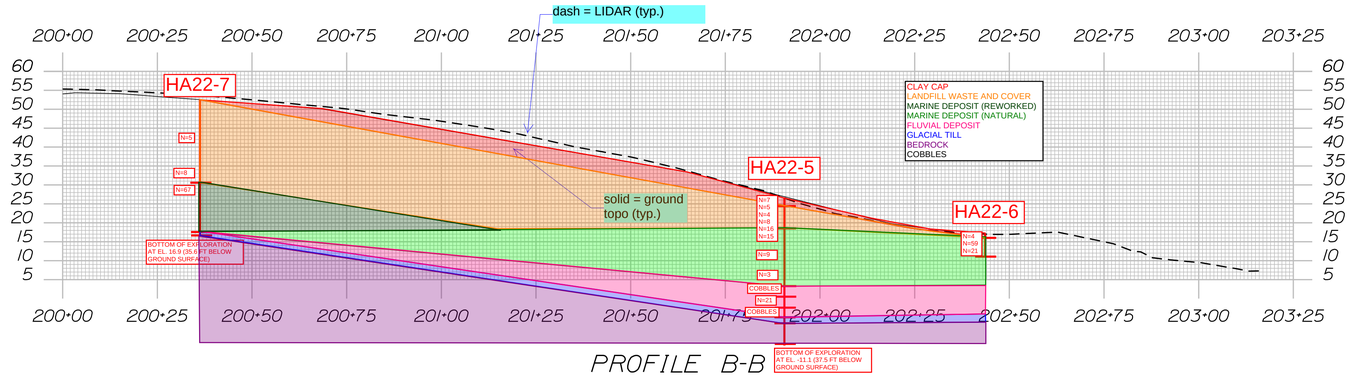
SCALE: AS SHOWN
SEPTEMBER 2022

FIGURE 1

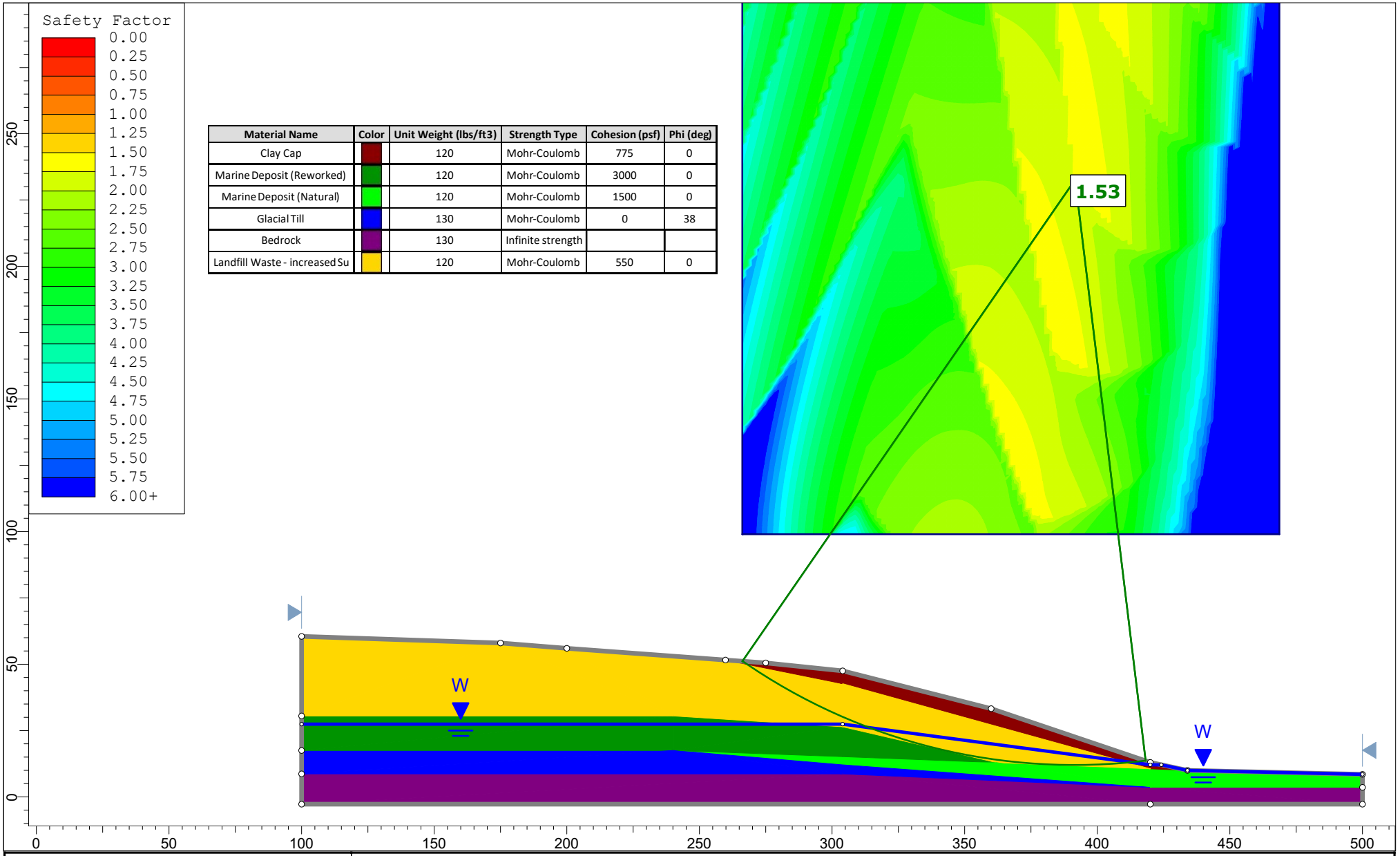
G:\PROJECTS\130749 - 2017 MEDOT Env. Multi-PIN\009 - Machias Landfill\Field\2022-0928-HALeforce


dash = LIDAR (typ.)
solid = ground topo (typ.)
HA22-7
HA22-1/ HA22-1B
HA22-2
CLAY CAP
LANDFILL WASTE AND COVER
MARINE DEPOSIT (REWORKED)
MARINE DEPOSIT (NATURAL)
GLACIAL TILL
BEDROCK
Max Future Water Level El. 14.7
Current Water Level El. 27.4 (HA22-1) to El. 12.1 (HA22-2)
BOTTOM OF EXPLORATION AT EL. 16.9 (35.6 FT BELOW GROUND SURFACE)
BOTTOM OF EXPLORATION AT EL. 2.7 (44.0 FT BELOW GROUND SURFACE)
BOTTOM OF EXPLORATION AT EL. -2.7 (15.3 FT BELOW GROUND SURFACE)
100+00
100+25
100+50
100+75
101+00
101+25
101+50
101+75
102+00
102+25
102+50
102+75
103+00
103+25
103+50
103+75
104+00
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0

PROFILE A-A


dash = LIDAR (typ.)
200+00
200+25
200+50
200+75
201+00
201+25
201+50
201+75
202+00
202+25
202+50
202+75
203+00
203+25
60
55
50
45
40
35
30
25
20
15
10
5
HA22-7
HA22-5
HA22-6
CLAY CAP
LANDFILL WASTE AND COVER
MARINE DEPOSIT (REWORKED)
MARINE DEPOSIT (NATURAL)
FLUVIAL DEPOSIT
GLACIAL TILL
BEDROCK
COBBLES
solid = ground
topo (typ.)
N=5
N=8
N=27
N=7
N=5
N=4
N=8
N=16
N=15
N=9
N=3
COBBLES
N=21
COBBLES
N=4
N=59
N=21
BOTTOM OF EXPLORATION
AT EL. 16.9 (35.6 FT BELOW
GROUND SURFACE)
BOTTOM OF EXPLORATION
AT EL. -11.1 (37.5 FT BELOW
GROUND SURFACE)

PROFILE B-B

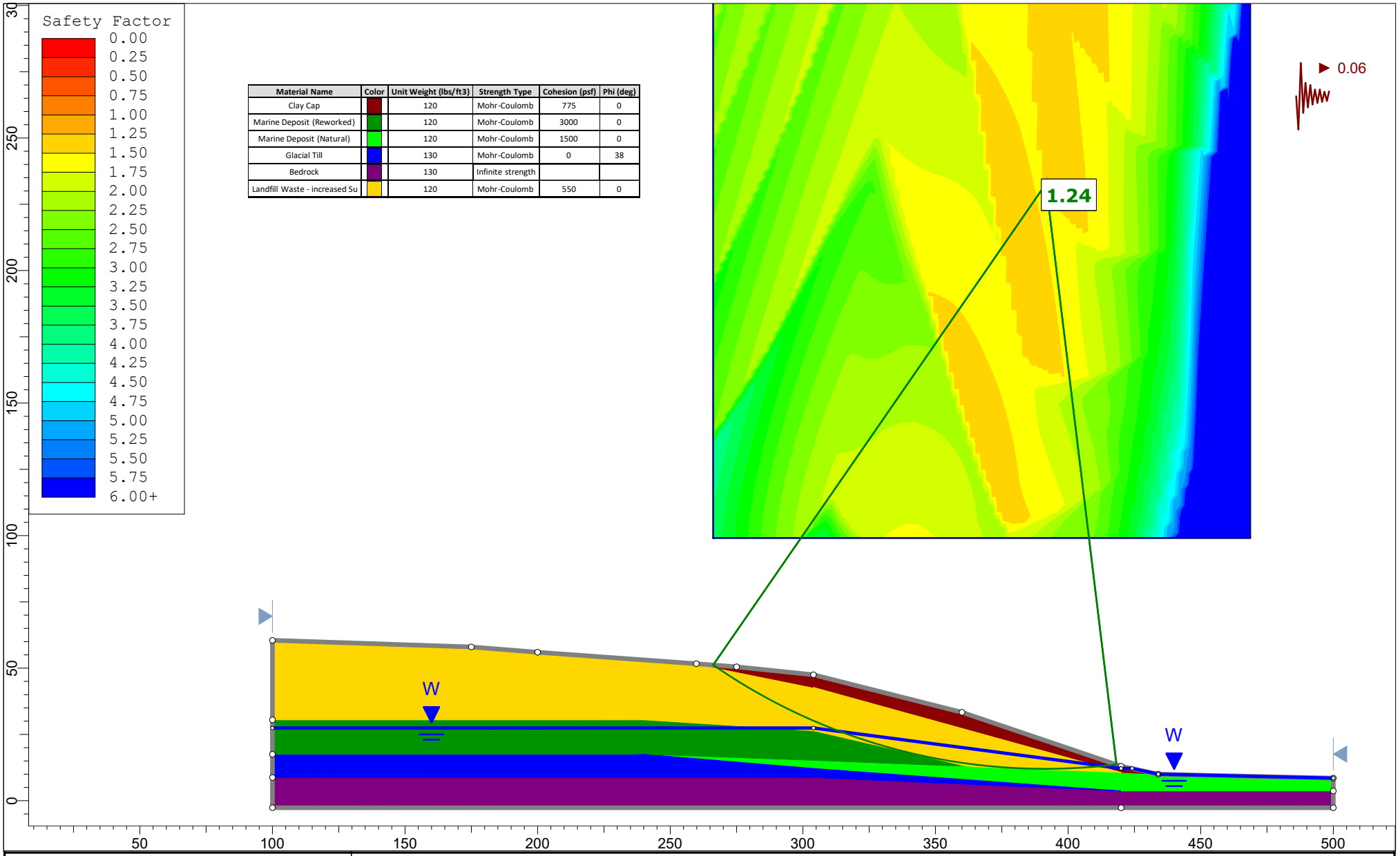


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clay Cap		120	Mohr-Coulomb	775	0
Marine Deposit (Reworked)		120	Mohr-Coulomb	3000	0
Marine Deposit (Natural)		120	Mohr-Coulomb	1500	0
Glacial Till		130	Mohr-Coulomb	0	38
Bedrock		130	Infinite strength		
Landfill Waste - increased Su		120	Mohr-Coulomb	550	0

rocscience

SLIDEINTERPRET 9.023

Project	Slide2 - An Interactive Slope Stability Program
Analysis Description	Section AA - Static
Drawn By	*Company*
Date 9/23/2022, 9:01:45 AM	*File Name* 2022-1018-Section AA Stability-DF.slmd

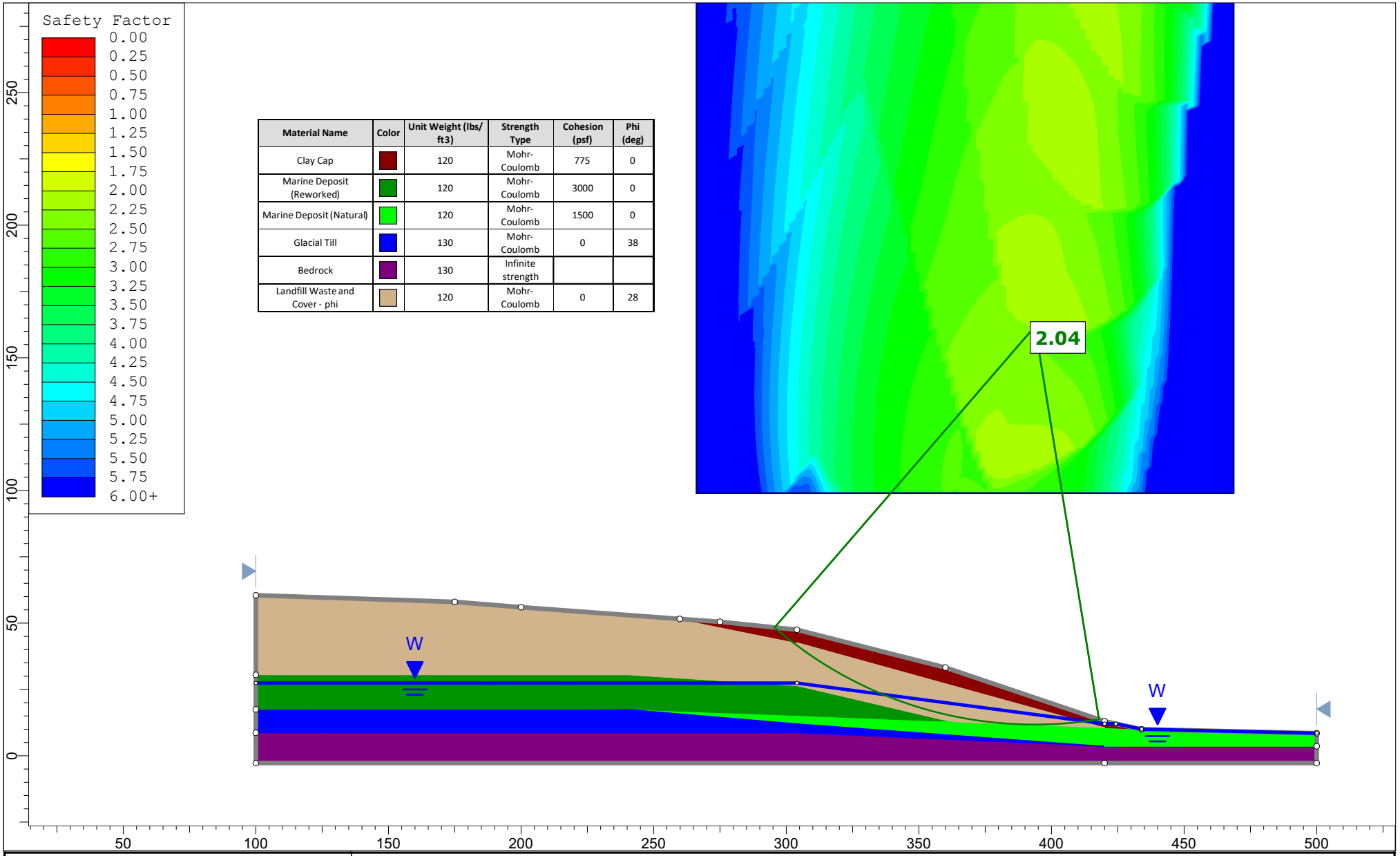


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clay Cap		120	Mohr-Coulomb	775	0
Marine Deposit (Reworked)		120	Mohr-Coulomb	3000	0
Marine Deposit (Natural)		120	Mohr-Coulomb	1500	0
Glacial Till		130	Mohr-Coulomb	0	38
Bedrock		130	Infinite strength		
Landfill Waste - increased Su		120	Mohr-Coulomb	550	0

rocscience

SLIDEINTERPRET 9.023

Project	Slide2 - An Interactive Slope Stability Program
Analysis Description	Section AA - Seismic
Drawn By	*Company*
Date 9/23/2022, 9:01:45 AM	*File Name* 2022-1018-Section AA Stability-DF.slmd

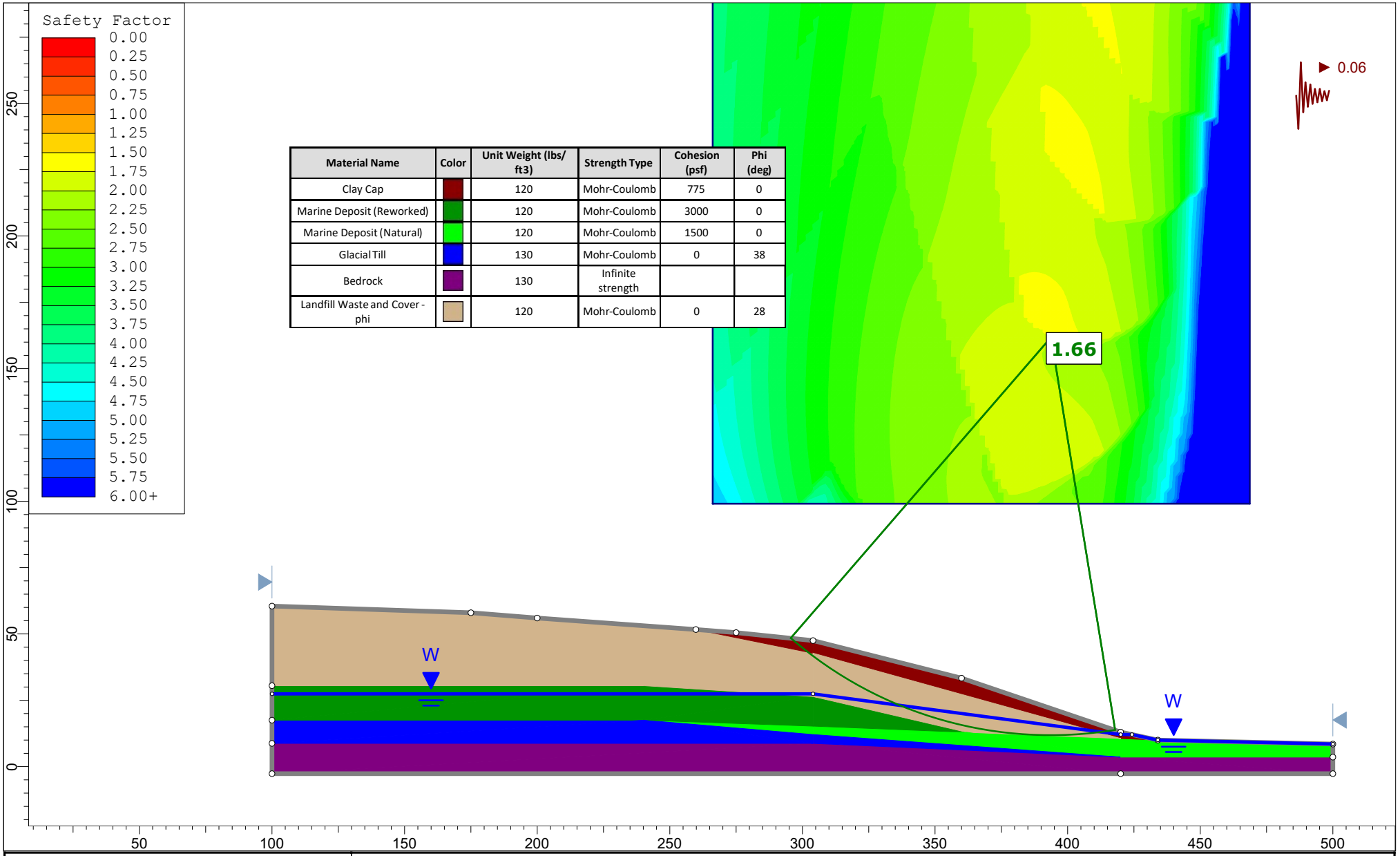


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clay Cap		120	Mohr-Coulomb	775	0
Marine Deposit (Reworked)		120	Mohr-Coulomb	3000	0
Marine Deposit (Natural)		120	Mohr-Coulomb	1500	0
Glacial Till		130	Mohr-Coulomb	0	38
Bedrock		130	Infinite strength		
Landfill Waste and Cover - phi		120	Mohr-Coulomb	0	28

rocscience

SLIDEINTERPRET 9.023

Project	Slide2 - An Interactive Slope Stability Program		
Analysis Description	Section AA - Static (Cohesionless Landfill Waste Properties)		
Drawn By		*Company*	
Date	9/23/2022, 9:01:45 AM	*File Name*	2022-0930-Section AA Stability-D3.slmd

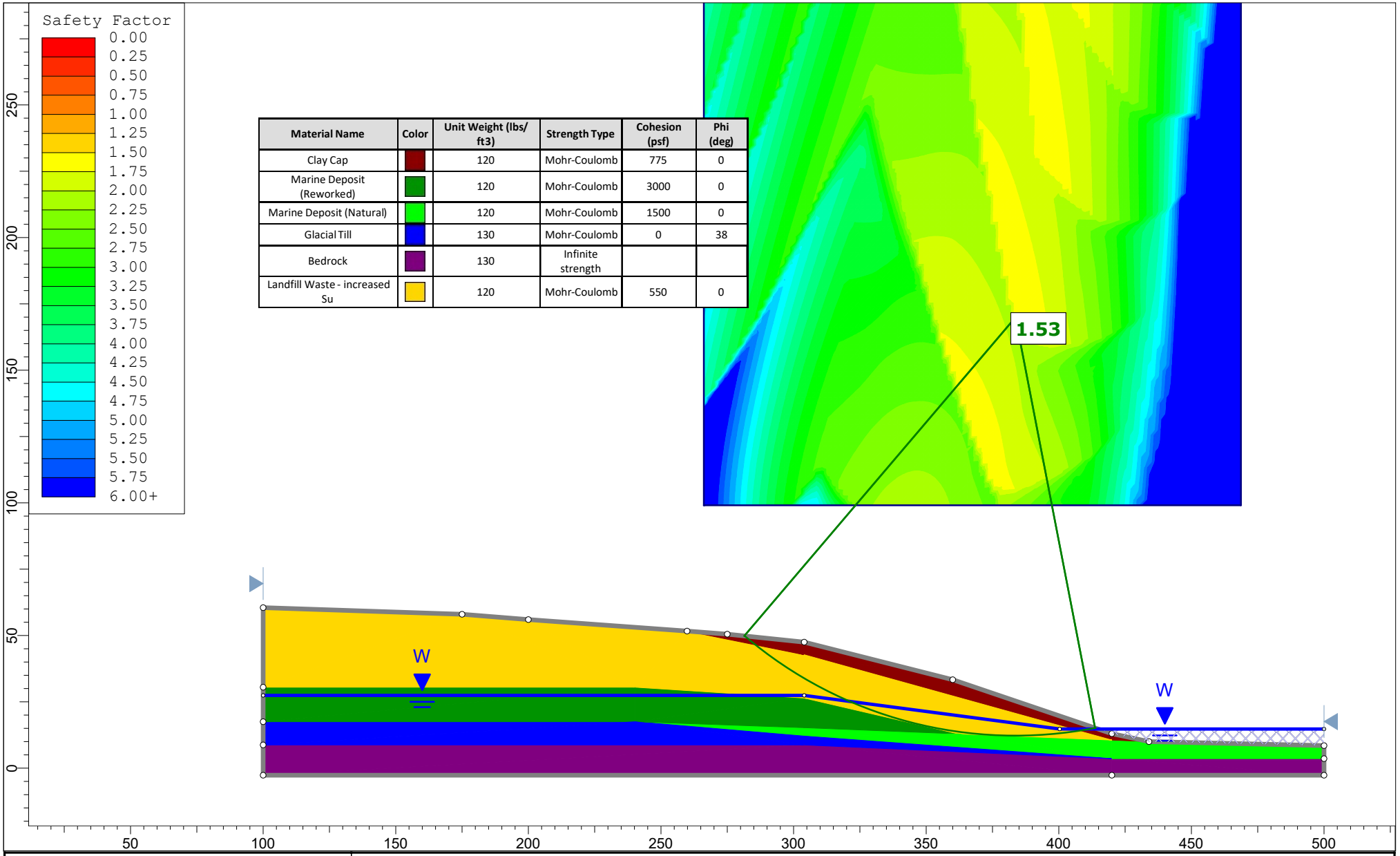


Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clay Cap		120	Mohr-Coulomb	775	0
Marine Deposit (Reworked)		120	Mohr-Coulomb	3000	0
Marine Deposit (Natural)		120	Mohr-Coulomb	1500	0
Glacial Till		130	Mohr-Coulomb	0	38
Bedrock		130	Infinite strength		
Landfill Waste and Cover - phi		120	Mohr-Coulomb	0	28

rocscience

SLIDEINTERPRET 9.023

Project	Slide2 - An Interactive Slope Stability Program
Analysis Description	Section AA - Seismic (Cohesionless Landfill Waste Properties)
Drawn By	*Company*
Date 9/23/2022, 9:01:45 AM	*File Name* 2022-1018-Section AA Stability-DF.slmd



Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clay Cap		120	Mohr-Coulomb	775	0
Marine Deposit (Reworked)		120	Mohr-Coulomb	3000	0
Marine Deposit (Natural)		120	Mohr-Coulomb	1500	0
Glacial Till		130	Mohr-Coulomb	0	38
Bedrock		130	Infinite strength		
Landfill Waste - increased Su		120	Mohr-Coulomb	550	0

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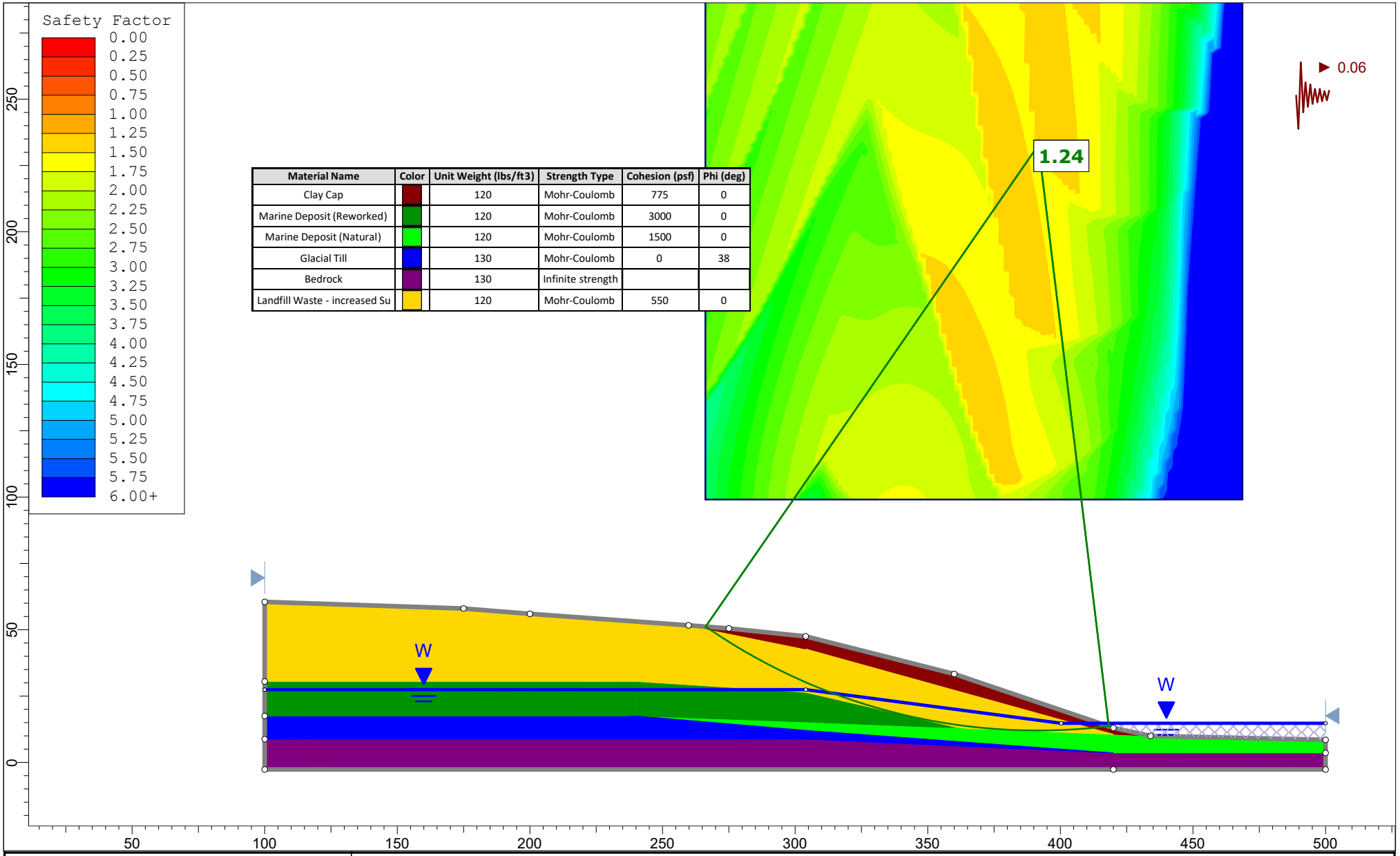
SLIDEINTERPRET 9.023

Project	Slide2 - An Interactive Slope Stability Program	
Analysis Description	Section AA - Static (High Water)	
Drawn By		*Company*
Date	9/23/2022, 9:01:45 AM	*File Name* 2022-1018-Section AA Stability-DF.slmd

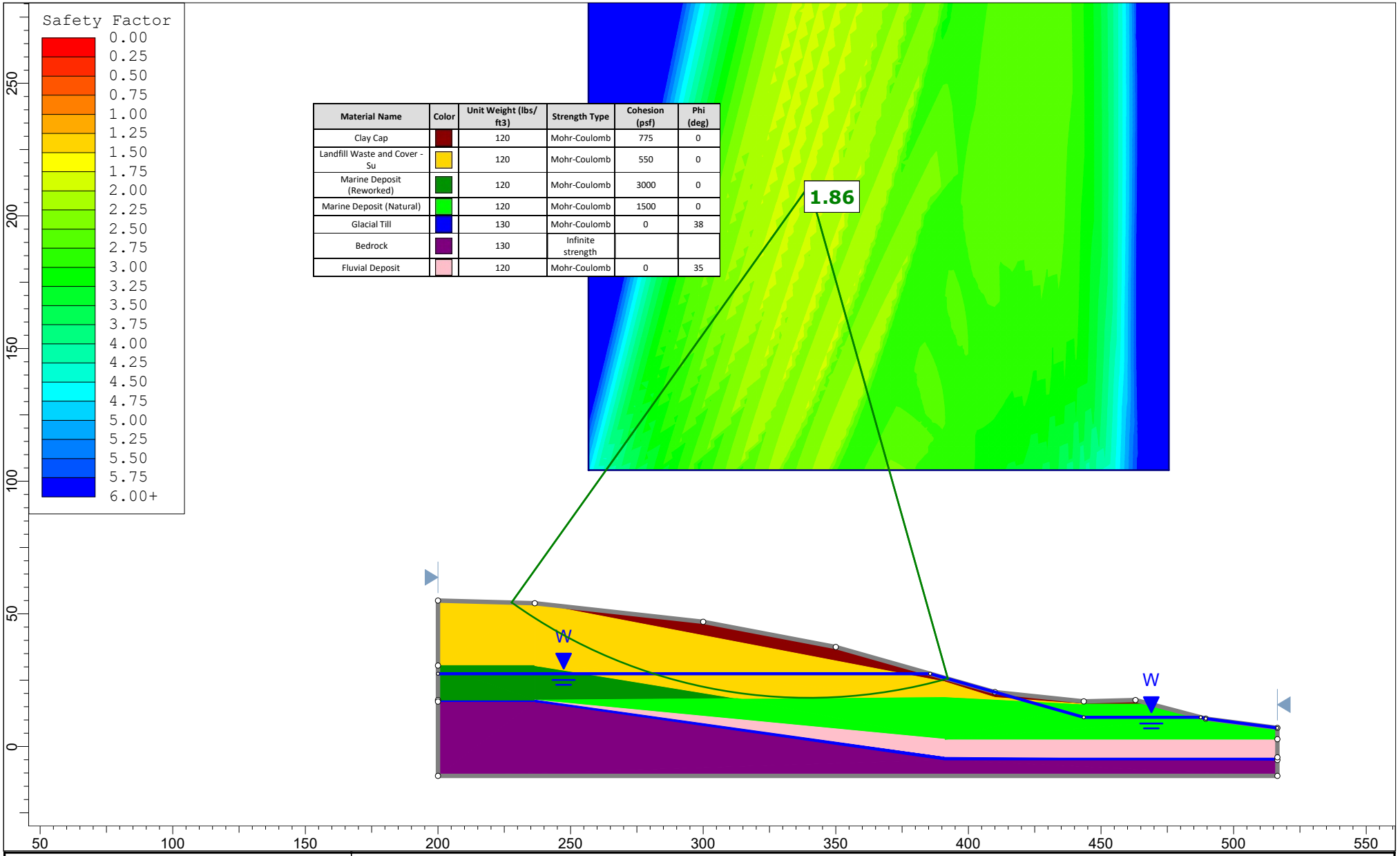


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clay Cap		120	Mohr-Coulomb	775	0
Marine Deposit (Reworked)		120	Mohr-Coulomb	3000	0
Marine Deposit (Natural)		120	Mohr-Coulomb	1500	0
Glacial Till		130	Mohr-Coulomb	0	38
Bedrock		130	Infinite strength		
Landfill Waste - increased Su		120	Mohr-Coulomb	550	0

rocscience

SLIDEINTERPRET 9.023

Project	Slide2 - An Interactive Slope Stability Program		
Analysis Description	Section AA - Seismic (High Water)		
Drawn By		*Company*	
Date	9/23/2022, 9:01:45 AM	*File Name*	2022-1018-Section AA Stability-DF.slmd

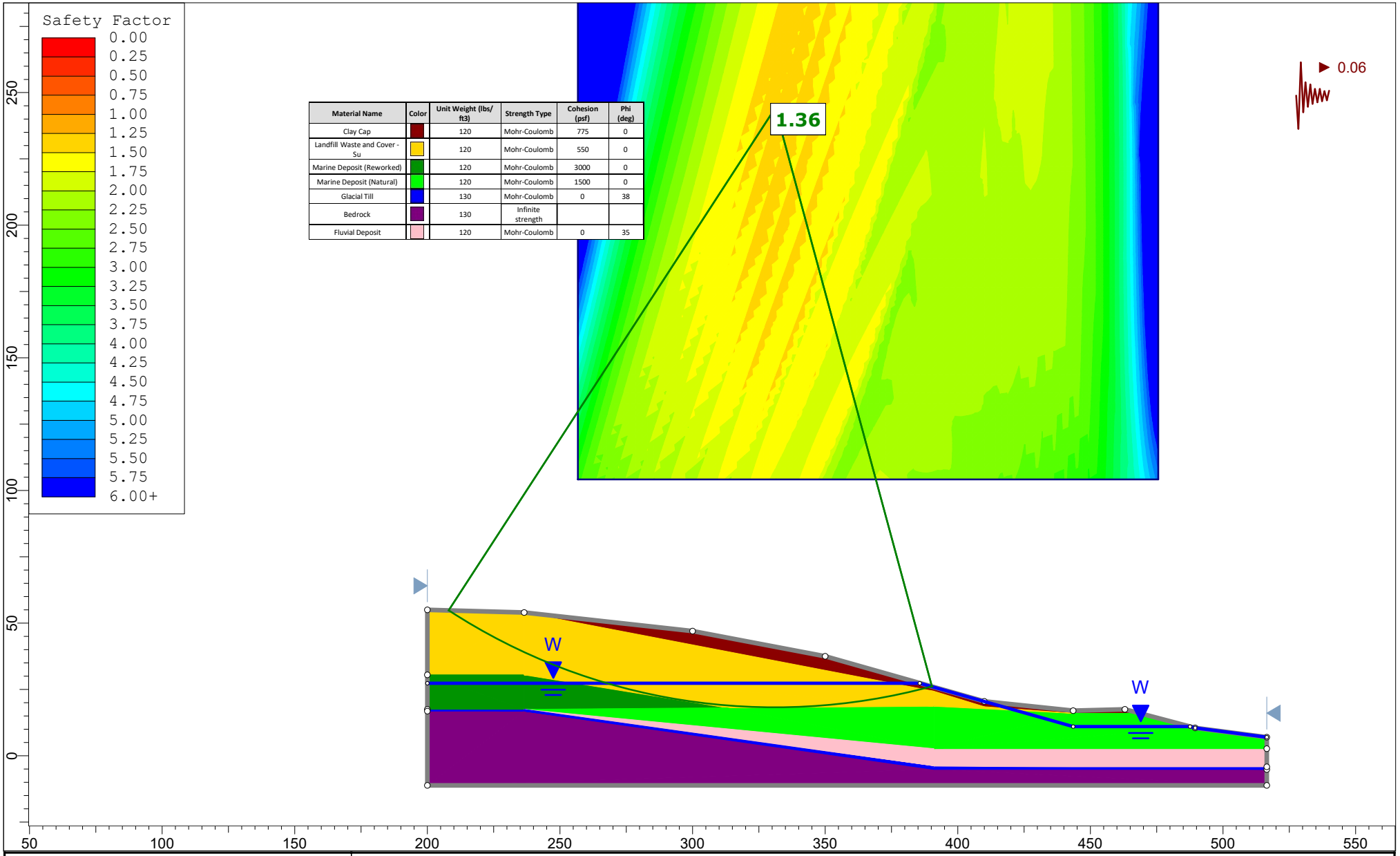


Material Name	Color	Unit Weight (lbs/ ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clay Cap		120	Mohr-Coulomb	775	0
Landfill Waste and Cover - Su		120	Mohr-Coulomb	550	0
Marine Deposit (Reworked)		120	Mohr-Coulomb	3000	0
Marine Deposit (Natural)		120	Mohr-Coulomb	1500	0
Glacial Till		130	Mohr-Coulomb	0	38
Bedrock		130	Infinite strength		
Fluvial Deposit		120	Mohr-Coulomb	0	35

rocscience

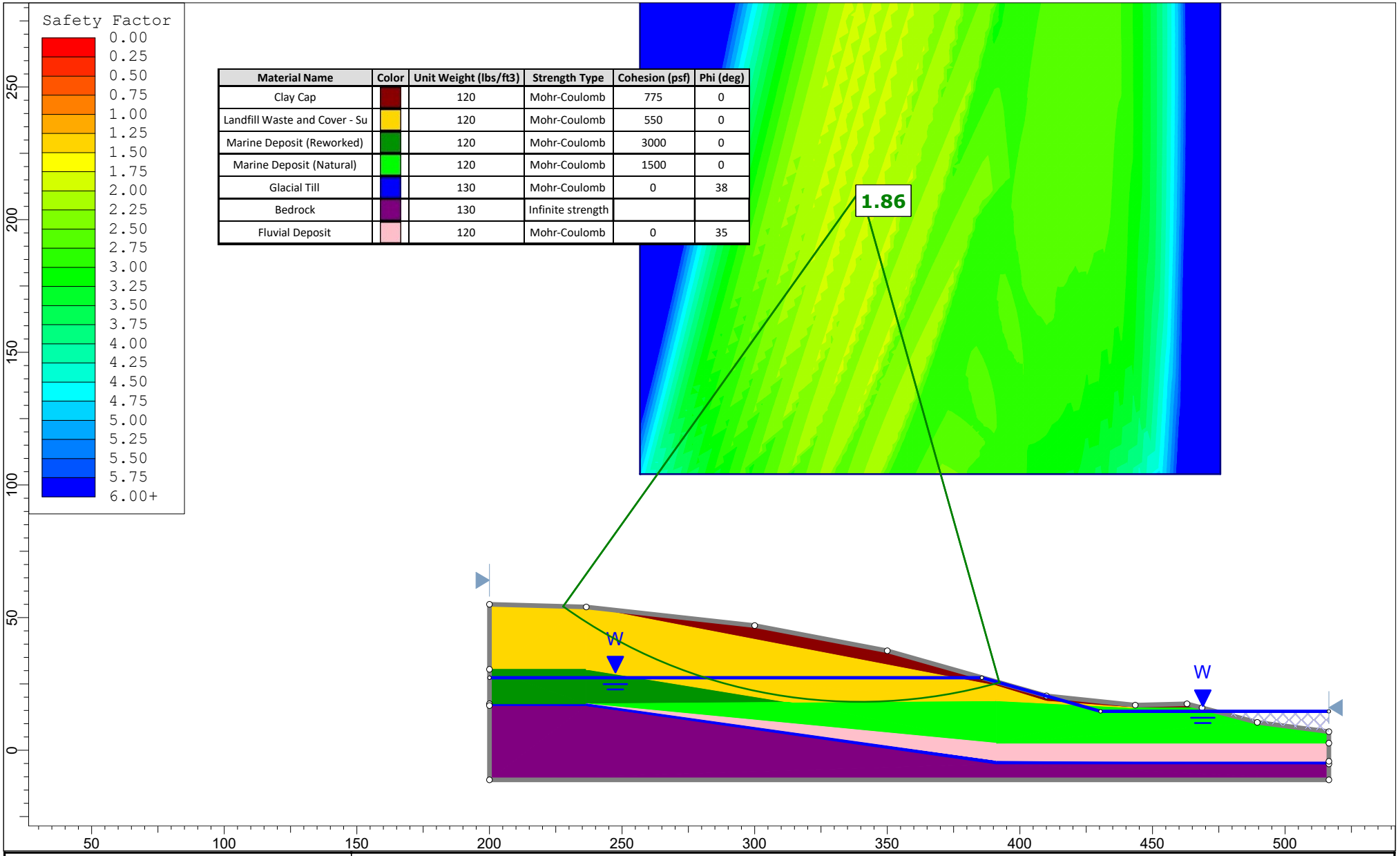
SLIDEINTERPRET 9.023

Project	Slide2 - An Interactive Slope Stability Program
Analysis Description	Section BB - Static
Drawn By	*Company*
Date 9/23/2022, 9:01:45 AM	*File Name* 2022-1018-Section BB Stability-DF.slmd



rocscience	*Project*	Slide2 - An Interactive Slope Stability Program
	Analysis Description	Section BB - Seismic
	Drawn By	*Company*
	Date 9/23/2022, 9:01:45 AM	*File Name* 2022-1018-Section BB Stability-DF.slmd

SLIDEINTERPRET 9.023

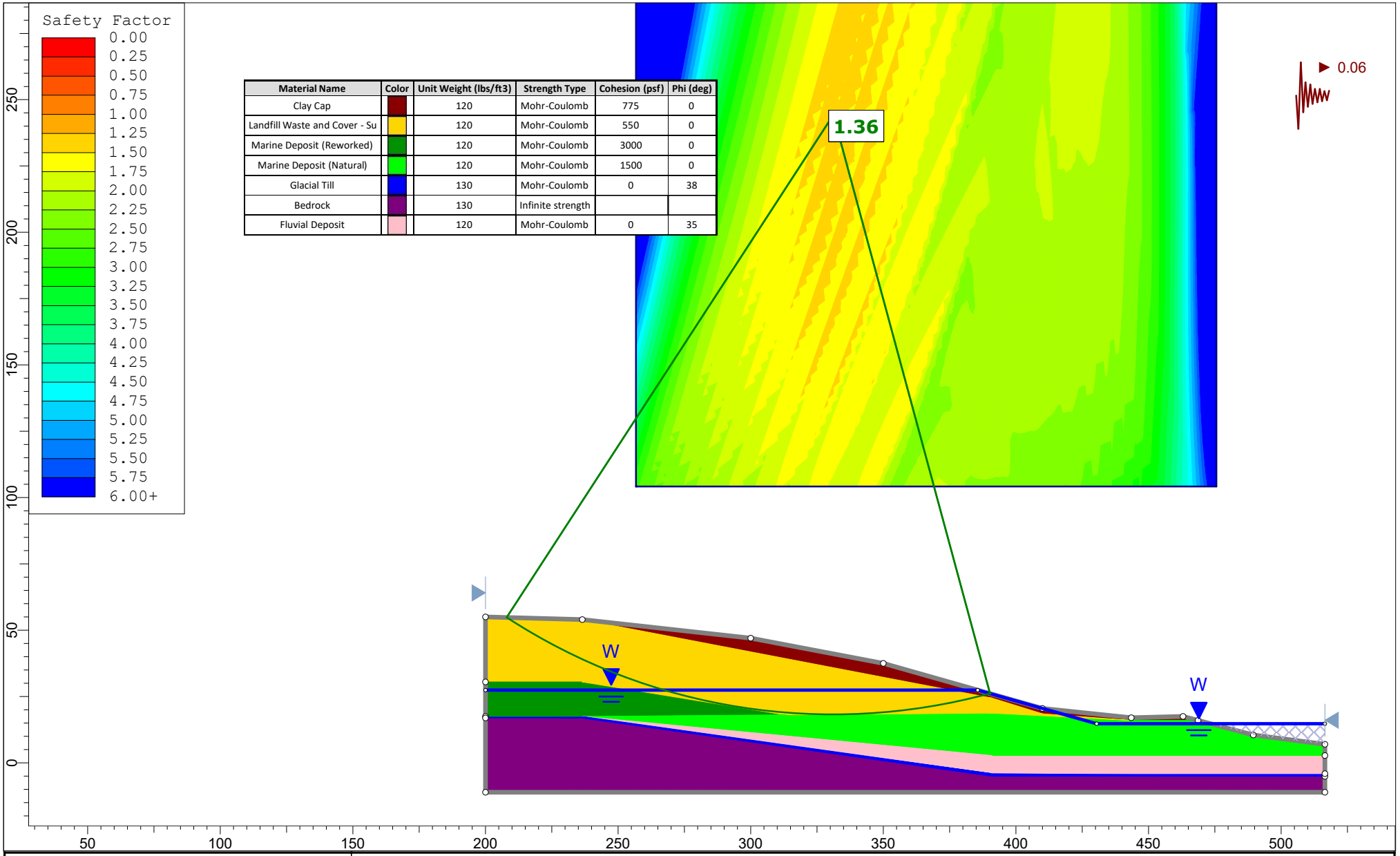


Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clay Cap		120	Mohr-Coulomb	775	0
Landfill Waste and Cover - Su		120	Mohr-Coulomb	550	0
Marine Deposit (Reworked)		120	Mohr-Coulomb	3000	0
Marine Deposit (Natural)		120	Mohr-Coulomb	1500	0
Glacial Till		130	Mohr-Coulomb	0	38
Bedrock		130	Infinite strength		
Fluvial Deposit		120	Mohr-Coulomb	0	35

rocscience

SLIDEINTERPRET 9.023

Project	Slide2 - An Interactive Slope Stability Program		
Analysis Description	Section BB - Static (High Water)		
Drawn By		*Company*	
Date	9/23/2022, 9:01:45 AM	*File Name*	2022-1018-Section BB Stability-DF.slmd



Material Name	Color	Unit Weight (lbs/ft3)	Strength Type	Cohesion (psf)	Phi (deg)
Clay Cap		120	Mohr-Coulomb	775	0
Landfill Waste and Cover - Su		120	Mohr-Coulomb	550	0
Marine Deposit (Reworked)		120	Mohr-Coulomb	3000	0
Marine Deposit (Natural)		120	Mohr-Coulomb	1500	0
Glacial Till		130	Mohr-Coulomb	0	38
Bedrock		130	Infinite strength		
Fluvial Deposit		120	Mohr-Coulomb	0	35

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SLIDEINTERPRET 9.023

Project	Slide2 - An Interactive Slope Stability Program
Analysis Description	Section BB - Seismic (High Water)
Drawn By	Company
Date: 9/23/2022, 9:01:45 AM	File Name: 2022-1018-Section BB Stability-DF.slmd