FUSS & O'NEILL

February 17, 2023

Via Electronic Mail
library.director@shutesbury.org

Ms. Mary Anne Antonellis
Director, M.N. Spear Memorial Library
10 Cooleyville Road
PO Box 256
Shutesbury, MA 01072

RE: RTN 1-21489 – January 2023 Groundwater Investigation Memo
66 Leverett Rd., Shutesbury, MA
Fuss & O'Neill Project No. 20091032.A22

Dear Ms. Antonellis:

On behalf of the Town of Shutesbury (The Town), Fuss & O'Neill, Inc. (Fuss & O'Neill) has been undertaking response actions under the Massachusetts Contingency Plan (MCP; 310 CMR 40) related to Release Tracking Number (RTN) 1-21489, located at 66 Leverett Road property in Shutesbury, Massachusetts (the Site). This letter outlines the results of the groundwater sampling event conducted by Fuss & O'Neill at the Site on January 11, 2023.

1.0 Background

During a subsurface investigation conducted by O'Reilly, Talbot & Okun Engineering Associates (OTO) in October 2021, Volatile Petroleum Hydrocarbons (VPH) (specifically, C5-C8 aliphatic hydrocarbon range), were detected in a soil sample at levels exceeding applicable Massachusetts Department of Environmental Protection (MassDEP) Reportable Criteria (the RCS-1). This release condition was reported to the MassDEP by the Town on January 28, 2022, and was assigned RTN 1-21489. The area where the reportable condition was identified was historically leased by the United States Air Force and operated as the Shutesbury – Westover Remote Site from 1957 until 1967. The specific soil sample that contained VPH at concentrations exceeding applicable reportable criteria was collected in the vicinity of a historic gasoline underground storage tank (UST) (removed by the U.S. Army Corp of Engineers [USACOE] in 1994) that was used to fuel an emergency generator associated with the facility.

Fuss & O'Neill conducted a Limited Phase II Subsurface Investigation at the Site in November and December of 2022, which included soil and groundwater investigation activities within the area of the historic UST. The November and December 2022 investigation included the installation of one (1) groundwater monitoring well, MW-09. The well was installed adjacent to soil boring B-13, which exhibited the highest total volatile organics (TOV) screening during the soil boring investigation utilizing a photoionization device (PID). Fuss & O'Neill returned to the Site on

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Suite 400
Springfield, MA
01103
t 413.452.0445
800.286.2469
f 860.533.5143

www.fando.com

California
Connecticut
Maine
Massachusetts
New Hampshire
New York
Rhode Island
Vermont

December 2, 2022, to collect a groundwater sample from monitoring well MW-09. Groundwater analytical results were compared to the MassDEP GW-1 and GW-3 standards. Select VPH Ranges and Target Volatile Organic Compounds (VOCs), select Extractable Petroleum Hydrocarbon (EPH) Ranges and Target Polycyclic Aromatic Hydrocarbons (PAHs), and Thallium, were detected at concentrations exceeding applicable GW-1 Method 1 Standards in the groundwater sample. The results of the December 2022 sampling are summarized in Table 1.

On behalf of the Town, Fuss & O'Neill prepared a Phase I Initial Site Investigation (ISI) & Tier I Classification Submittal, which was submitted to the MassDEP on January 28, 2023. The Phase I ISI & Tier Classification Submittal detailed the investigatory response actions related to RTN 1-21489 completed to-date, with the exception of the analytical results for groundwater samples collected in January 2023, which are the subject of this letter, as summarized below.

2.0 January 2023 Groundwater Investigation

Monitoring Well Installation

Following review of the initial groundwater data from monitoring well MW-9, it was determined that installation of additional groundwater monitoring wells was necessary to better characterize the nature and extent of the groundwater condition, as well as to better assess the groundwater flow direction and hydraulic gradient at the Site. On January 4, 2023, Fuss & O'Neill returned to the Site to oversee the installation of four (4) additional monitoring wells, designated MW-10, MW-12, MW-13, and MW-14. Monitoring well development was completed on January 10, 2023, to improve the hydraulic interaction with the surrounding aquifer. A relative survey, based off the surveyed elevation of monitoring well MW-09, was completed for the top of casing elevation of monitoring wells MW-10, MW-12, MW-13, and MW-13. A Site Plan is included as *Figure 1* and a figure depicting the measured groundwater flow direction in the vicinity of the release area (based on depth to groundwater measurements collected during the January 11, 2023 sampling event) is included as *Figure 2*.

Groundwater Monitoring Well Sampling

Fuss & O'Neill returned to the Site on January 11, 2023, to sample monitoring wells MW-09, MW-10, MW-12, MW-13, and MW-14. As part of the groundwater monitoring activity in January 2023, the depth to water was recorded at each monitoring well location. Depth to water was observed between approximately 3 and 7.6 feet below ground surface (bgs). Local groundwater flow in the vicinity of the release area is to the southwest, based on the January 2023 measurements.

The monitoring wells were purged prior to sample collection using industry standard low-flow procedures.

The groundwater samples were submitted under Chain of Custody to New England Testing Laboratory (NETLAB) of West Warwick, Rhode Island, for laboratory analysis of the following parameters:

- EPH with Target PAHs according to the MassDEP Method
- VPH with Target VOCs according to the MassDEP Method
- MassDEP Compendium of Analytical Methods (CAM) 14 Metals according to the United States Environmental Protection Agency (USEPA) Method 6020B (Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium, Lead, Mercury, Nickel, Selenium, Silver, Thallium, Vanadium, and/or Zinc).

A summary of the groundwater samples submitted for laboratory analysis is included below in Table 2.

Table 2
Summary of Groundwater Samples – January 11, 2023

Location	Sample Number	Analysis
MW-09	0111-01	CAM 14 Metals, EPH w/ target PAHs, and VPH w/ Target VOCs
MW-10	0111-02	
MW-12	0111-03	
MW-13	0111-04	
MW-14	0111-05	

Notes: Only the last six digits of the sample identification number are listed.

Groundwater Sampling Data Analysis

Groundwater analytical results were compared to the applicable MassDEP Method 1 GW-1 and GW-3 risk-based standards. The GW-1 standards are protective of potential drinking water resources while the GW-3 standards are protective of surface water receptors.

The January 11, 2023, groundwater sampling data are summarized as follows:

- The sample collected from groundwater monitoring well MW-09 contained concentrations of 2-Methylnaphthalene, Antimony, Ethylbenzene, Naphthalene, C5-C8 Aliphatic Hydrocarbons, C9-C12 Aliphatic Hydrocarbons, and C9-C10 Aromatic Hydrocarbons exceeding applicable Method 1 GW-1 standards. No analytes were detected at concentrations exceeding applicable Method 1 GW-3 standards.
- The samples collected from groundwater monitoring wells MW-10 and MW-12 contained concentrations of Antimony, C5-C8 Aliphatic Hydrocarbons, C9-C12 Aliphatic Hydrocarbons, and C9-C10 Aromatic Hydrocarbons exceeding applicable Method 1 GW-1

standards in both samples. No analytes were detected at concentrations exceeding applicable Method 1 GW-3 standards.

- The analytical results for samples collected from groundwater monitoring wells MW-13 and MW-14 indicated that concentrations of the tested analytes detected were below the applicable Method 1 GW-1 and GW-3 standards.

The laboratory analytical report from the January 11, 2023 groundwater sampling is included in *Attachment A*, and the analytical data are presented in *Table 1*.

3.0 Conclusions and Recommendations

Although exceedances of applicable GW-1 criteria were observed in samples collected from groundwater monitoring wells MW-09, MW-10, and MW-12 during the January 2023 groundwater sampling event, the analytical results for samples collected from groundwater monitoring well MW-9 showed an overall decrease in concentrations of petroleum-related compounds compared to the December 2022 groundwater analytical data for that well.

Based upon the results from the January 2023 groundwater sampling event, it is recommended that the Town proceed with quarterly groundwater monitoring at the Site to better assess seasonal variation in groundwater conditions. Based upon the results of subsequent groundwater monitoring events at the Site, it may be prudent to install one or more additional wells in the vicinity of the currently identified petroleum release area, in order to better define the nature and extent of the impacted groundwater and evaluate potential fluctuations in groundwater flow patterns. It is recommended that the next quarterly groundwater monitoring event be conducted during Spring 2023.

If you have any questions regarding the information presented herein, please contact either of the undersigned at 413-333-5472.

Sincerely,

Matthew Kissane
Senior Geologist

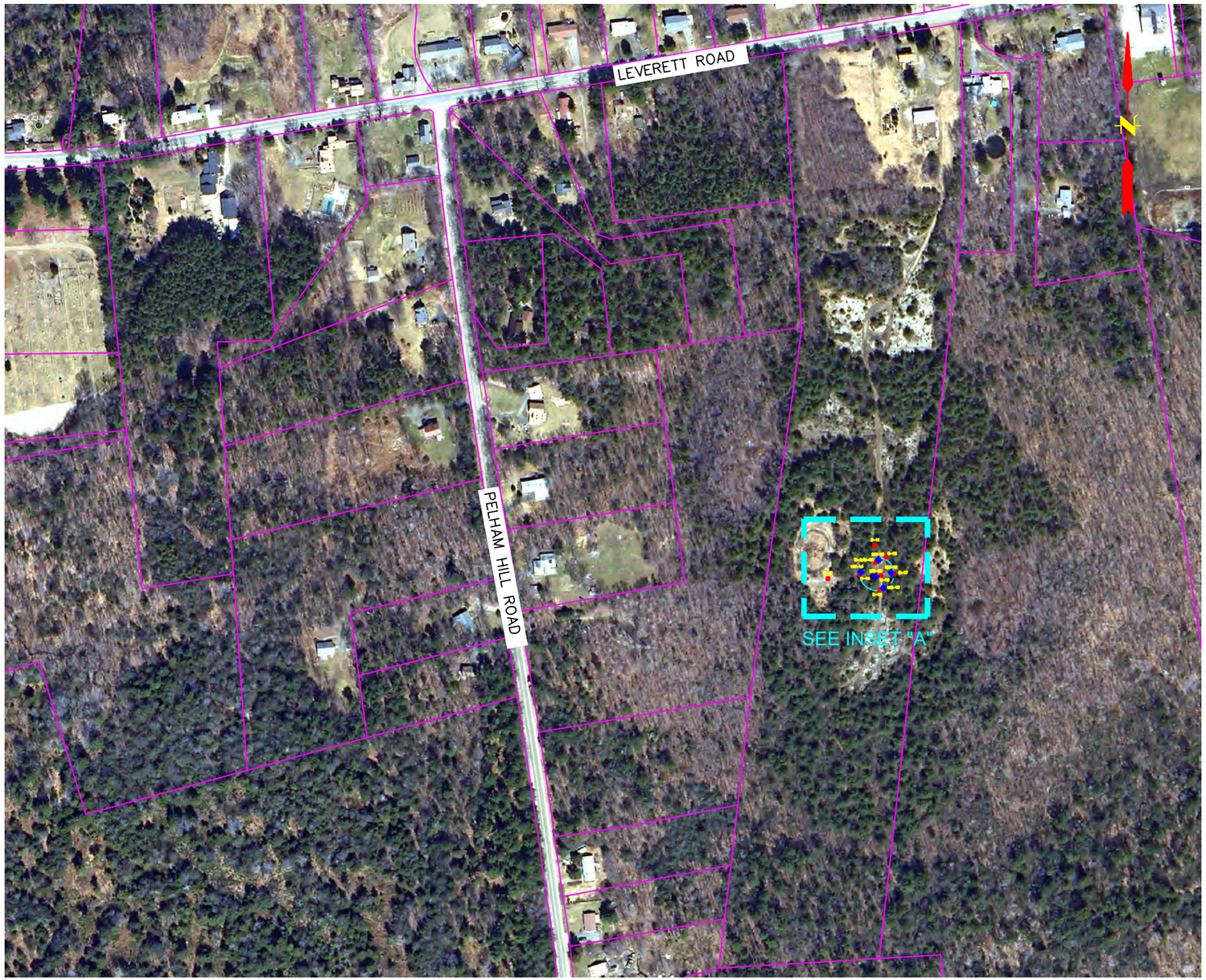
Timothy Clinton, CPG, LSP
Project Manager

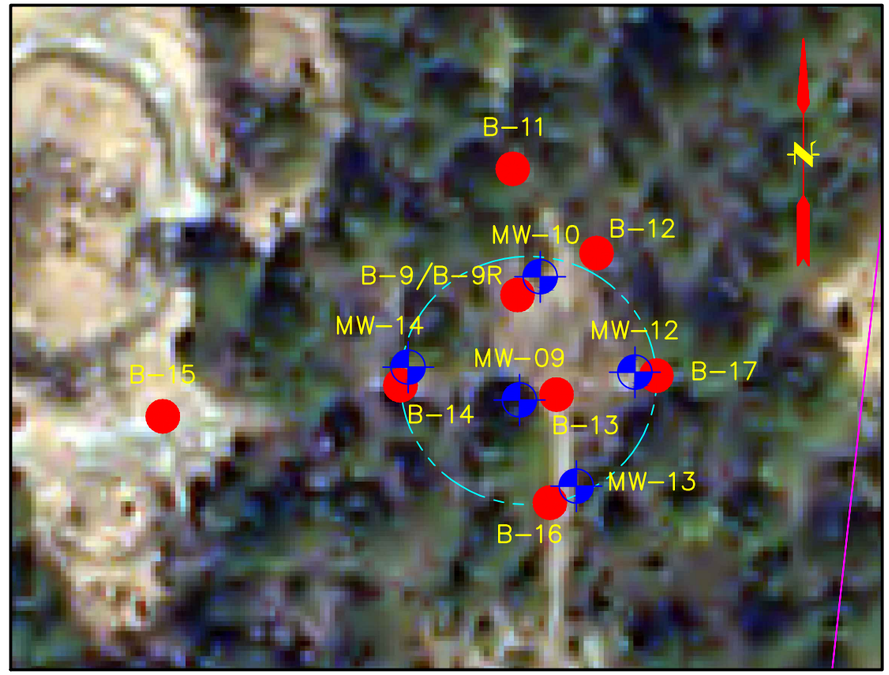
Attachments: Figures
Table
A - Analytical Laboratory Report

Cc: Rebecca Torres, Town of Shutesbury Administrator
Rita Farrell, Town of Shutesbury Selectboard Chair

FUSS & O'NEILL

Figures





A INSET

SCALE: 1"= 50'

LEGEND

B–XX
SOIL BORING

MW–XX
MONITORING WELL

PRELIMINARY DISPOSAL SITE BOUNDARY

PROPERTY BOUNDARY

MAP REFERENCE:

THIS MAP WAS PREPARED FROM MASSGIS AERIAL IMAGERY (2005). THE SITE PLAN WAS PREPARED BY FUSS &O'NEILL (JANUARY 2023)

SOURCE: OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1" - 300'
VERT.:
DATUM:
HORZ.:
VERT.:
0 150 300
GRAPHIC SCALE

FUSS&O'NEILL
1550 MAIN STREET, SUITE 400
SPRINGFIELD, MA 01103
413.452.0445
www.fando.com

TOWN OF SHUTESBURY

SITE PLAN

66 LEVERETT ROAD

SHUTESBURY MASSACHUSETTS

PROJ. No.: 20091032.A22
DATE: 01/26/2023

FIGURE 1

GROUNDWATER ELEVATIONS (FT AMSL)	
MW–09	1177.60
MW–10	1181.38
MW–12	1180.08
MW–13	1180.05
MW–14	1177.61

NOTES: FT AMSL= FEET ABOVE MEAN SEA LEVEL
ELEVATIONS MEASURED ON 1/11/2023

MAP REFERENCE:

THIS MAP WAS PREPARED FROM MASSGIS AERIAL IMAGERY (2019). THE SITE PLAN WAS PREPARED BY FUSS &O'NEILL (JANUARY 2023)

SOURCE: OFFICE OF GEOGRAPHIC AND ENVIRONMENTAL INFORMATION (MASSGIS), COMMONWEALTH OF MASSACHUSETTS EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS

GROUNDWATER ELEVATION DATA IS PARTIALLY BASED ON A SURVEY PREPARED BY HAROLD L. EATON AND ASSOCIATES, INC. FOR THE TOWN OF SHUTESBURY, DATED JANUARY 4, 2023.

LEGEND

MONITORING WELL — MW–XX

PRELIMINARY DISPOSAL SITE BOUNDARY

GROUNDWATER ELEVATION CONTOURS — 1181

GROUNDWATER FLOW DIRECTION

No.	DATE	DESCRIPTION	DESIGNER	REVIEWER

SCALE:
HORZ.: 1" - 30'
VERT.:
DATUM:
HORZ.:
VERT.:
0 15 30
GRAPHIC SCALE

FUSS&O'NEILL
1550 MAIN STREET, SUITE 400
SPRINGFIELD, MA 01103
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TOWN OF SHUTESBURY

GROUNDWATER ELEVATION CONTOUR MAP

66 LEVERETT ROAD

SHUTESBURY MASSACHUSETTS

PROJ. No.: 20091032.A22
DATE: 01/26/2023

FIGURE 2

File: J:\DWG\P2009\91032A22\Environmental\Plan\Phase I ISI and Tier I Classification\20091032.A22_STP01-GWCONTOURS.dwg Layout: 11X17-L Plotted: 2023-01-27 3:26 PM Saved: 2023-01-27 3:25 PM User: Cotis
PC3: DWG TO PDF.PC3 STB/CTB: FO.STB
LAYER STATE:
MS VIEW:

FUSS & O'NEILL

Table

Table 1
Summary of Groundwater Quality Data and Objectives
66 Leverett Rd GW Memorandum
Shutesbury, Massachusetts
February 2023

	Sample Location	MW-9		MW-10	MW-12	MW-13	MW-14	MassDEP Method 1 Groundwater Standards	
	Sample ID	1701221202-01	1701230111-01	1701230111-02	1701230111-03	1701230111-04	1701230111-05	GW-1	GW-3
	Sample Date	12/2/2022	1/11/2023	1/11/2023	1/11/2023	1/11/2023	1/11/2023		
EPHs and Target PAH (MassDEP methodology)									
Naphthalene	ug/l	101	50.2	7.8	24.2	ND<1	3.2	140	20,000
2-Methylnaphthalene	ug/l	***23***	***11***	4.8	3.8	ND<1	ND<1	10	20,000
Phenanthrene	ug/l	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	40	10,000
Acenaphthene	ug/l	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	20	10,000
Acenaphthylene	ug/l	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	30	40
Fluorene	ug/l	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	30	40
Anthracene	ug/l	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	60	30
Fluoranthene	ug/l	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	90	200
Pyrene	ug/l	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	60	20
Benzo(a)anthracene	ug/l	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1	1,000
Chrysene	ug/l	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	ND<2.0	2	70
Benzo(b)fluoranthene	ug/l	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1	400
Benzo(k)fluoranthene	ug/l	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	1	100
Benzo(a)pyrene	ug/l	ND<0.2	ND<0.2	ND<0.2	ND<0.2	ND<0.2	ND<0.2	0.2	500
Indeno(1,2,3-cd)pyrene	ug/l	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.5	100
Dibenz(a,h)anthracene	ug/l	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5	0.5	40
Benzo(g,h,i)perylene	ug/l	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	50	20
C9-C18 Aliphatic Hydrocarbons	ug/l	***739***	ND<200	ND<200	ND<200	ND<200	ND<200	700	50,000
C19-C36 Aliphatic Hydrocarbons	ug/l	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	14,000	50,000
C11-C22 Aromatic Hydrocarbons	ug/l	***234***	ND<100	115	ND<100	121	115	200	5,000
CAM 14 Metals; Total Metals (USEPA methods 6010/7470)									
Antimony	mg/l	ND<0.005	***0.007***	***0.009***	***0.008***	ND<0.005	ND<0.005	0.006	8
Arsenic	mg/l	ND<0.01	ND<0.01	ND<0.01	ND<0.01	ND<0.01	ND<0.01	0.01	0.9
Barium	mg/l	ND<0.005	0.019	0.02	0.025	0.047	0.023	2	50
Beryllium	mg/l	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	0.004	0.2
Cadmium	mg/l	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	0.005	0.004
Chromium	mg/l	ND<0.005	ND<0.005	ND<0.005	ND<0.005	0.009	ND<0.005	0.1	0.3
Lead	mg/l	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.006	ND<0.007	0.015	0.01
Nickel	mg/l	0.006	ND<0.005	0.008	0.006	0.007	0.008	0.1	0.2
Selenium	mg/l	ND<0.01	ND<0.01	ND<0.01	ND<0.01	ND<0.01	ND<0.01	0.05	0.1
Silver	mg/l	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	0.1	0.007
Vanadium	mg/l	ND<0.005	ND<0.005	ND<0.005	ND<0.005	0.008	ND<0.005	0.03	4
Zinc	mg/l	0.022	ND<0.02	ND<0.02	ND<0.02	ND<0.02	ND<0.02	5	0.9
Thallium	mg/l	***0.01***	ND<0.005	ND<0.005	ND<0.005	ND<0.005	ND<0.005	0.002	3
Mercury	mg/l	ND<0.0005	ND<0.0005	ND<0.0005	ND<0.0005	ND<0.0005	ND<0.0005	0.002	0.02
VPHs and Target VOCs (MassDEP methodology)									
Benzene	ug/l	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	ND<5.0	5	10,000
Ethylbenzene	ug/l	***985***	***1080***	ND<5.0	193	ND<5.0	37.6	700	5,000
Methyl t-butyl ether (MTBE)	ug/l	ND<10.0	ND<10.0	ND<10	ND<10	ND<10	ND<10	70	50,000
Naphthalene	ug/l	***161***	***163***	ND<10	28.8	ND<10	ND<10	140	20,000
Toluene	ug/l	933	890	ND<5.0	337	ND<5.0	ND<5.0	1,000	40,000
m&p-Xylene	ug/l	2,000	1,770	ND<10	339	ND<10	15.1	10,000	5,000
o-Xylene	ug/l	770	611	ND<10	55.1	ND<10	ND<10	10,000	5,000
Total xylenes	ug/l	2,770	2,390	ND<10	394	ND<10	15.1	10,000	5,000
C5-C8 Aliphatic Hydrocarbons	ug/l	***10,900***	***7,980***	***695***	***1,500***	ND<100	122	300	50,000
C9-C12 Aliphatic Hydrocarbons	ug/l	***29,500***	***9,360***	***944***	***2,980***	ND<100	240	700	50,000
C9-C10 Aromatic Hydrocarbons	ug/l	***3,420***	***2,930***	***834***	***436***	ND<100	ND<100	200	50,000

Created By: CO
Checked By: MK

NOTES:

MassDEP: Massachusetts Department of Environmental Protection
USEPA: United States Environmental Protection Agency
CAM: Compendium of Analytical Methods
mg/l: milligrams per liter
ug/l: micrograms per liter
ND: Not Detected above reporting limit

EPHs: Extractable Petroleum Hydrocarbons
PAHs: Polycyclic Aliphatic Hydrocarbons
VPHs: Volatile Petroleum Hydrocarbons
VOCs: Volatile Organic Compounds
Results in shaded, bold, and italics meet or exceed one or more applicable Method 1 Cleanup Standards

FUSS & O'NEILL

Attachment A

Analytical Laboratory Report

New England Testing Laboratory, Inc.
(401) 353-3420

REPORT OF ANALYTICAL RESULTS

NETLAB Work Order Number: 3A12040
Client Project: 20091032.A22 - Shutesbury Library

Report Date: 23-January-2023

Prepared for:

Matt Kissane
Fuss & O'Neill
317 Iron Horse Way
Providence, RI 02908

Richard Warila, Laboratory Director
New England Testing Laboratory, Inc.
59 Greenhill Street
West Warwick, RI 02893
rich.warila@newenglandtesting.com

Samples Submitted :

The samples listed below were submitted to New England Testing Laboratory on 01/12/23. The group of samples appearing in this report was assigned an internal identification number (case number) for laboratory information management purposes. The client's designations for the individual samples, along with our case numbers, are used to identify the samples in this report. This report of analytical results pertains only to the sample(s) provided to us by the client which are indicated on the custody record. The case number for this sample submission is 3A12040. Custody records are included in this report.

Lab ID	Sample	Matrix	Date Sampled	Date Received
3A12040-01	1701230111-01	Water	01/11/2023	01/12/2023
3A12040-02	1701230111-02	Water	01/11/2023	01/12/2023
3A12040-03	1701230111-03	Water	01/11/2023	01/12/2023
3A12040-04	1701230111-04	Water	01/11/2023	01/12/2023
3A12040-05	1701230111-05	Water	01/11/2023	01/12/2023
3A12040-06	1701230111-06	Water	01/11/2023	01/12/2023

Request for Analysis

At the client's request, the analyses presented in the following table were performed on the samples submitted.

1701230111-01 (Lab Number: 3A12040-01)

Analysis	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Lead	EPA 6010C
MADEP EPH	MADEP EPH
MADEP VPH	MADEP VPH
Mercury	EPA 7470A
Nickel	EPA 6010C
Selenium	EPA 6010C
Silver	EPA 6010C
Thallium	EPA 6010C
Vanadium	EPA 6010C
Zinc	EPA 6010C

1701230111-02 (Lab Number: 3A12040-02)

Analysis	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Lead	EPA 6010C
MADEP EPH	MADEP EPH
MADEP VPH	MADEP VPH
Mercury	EPA 7470A
Nickel	EPA 6010C
Selenium	EPA 6010C
Silver	EPA 6010C
Thallium	EPA 6010C
Vanadium	EPA 6010C
Zinc	EPA 6010C

1701230111-03 (Lab Number: 3A12040-03)

Analysis	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Lead	EPA 6010C
MADEP EPH	MADEP EPH
MADEP VPH	MADEP VPH
Mercury	EPA 7470A
Nickel	EPA 6010C

Request for Analysis (continued)

1701230111-03 (Lab Number: 3A12040-03) (continued)

Analysis	Method
Selenium	EPA 6010C
Silver	EPA 6010C
Thallium	EPA 6010C
Vanadium	EPA 6010C
Zinc	EPA 6010C

1701230111-04 (Lab Number: 3A12040-04)

Analysis	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Lead	EPA 6010C
MADEP EPH	MADEP EPH
MADEP VPH	MADEP VPH
Mercury	EPA 7470A
Nickel	EPA 6010C
Selenium	EPA 6010C
Silver	EPA 6010C
Thallium	EPA 6010C
Vanadium	EPA 6010C
Zinc	EPA 6010C

1701230111-05 (Lab Number: 3A12040-05)

Analysis	Method
Antimony	EPA 6010C
Arsenic	EPA 6010C
Barium	EPA 6010C
Beryllium	EPA 6010C
Cadmium	EPA 6010C
Chromium	EPA 6010C
Lead	EPA 6010C
MADEP EPH	MADEP EPH
MADEP VPH	MADEP VPH
Mercury	EPA 7470A
Nickel	EPA 6010C
Selenium	EPA 6010C
Silver	EPA 6010C
Thallium	EPA 6010C
Vanadium	EPA 6010C
Zinc	EPA 6010C

1701230111-06 (Lab Number: 3A12040-06)

Analysis	Method
MADEP VPH	MADEP VPH

Method References

Method for the Determination of Extractable Petroleum Hydrocarbons, Rev. 2.1, Massachusetts Department of Environmental Protection, 2004

Method for the Determination of Volatile Petroleum Hydrocarbons, Rev. 2.1, Massachusetts Department of Environmental Protection, 2018

Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW846, USEPA

Case Narrative

Sample Receipt:

The samples associated with this work order were received in appropriately cooled and preserved containers. The chain of custody was adequately completed and corresponded to the samples submitted.

Exceptions: None

Analysis:

All samples were prepared and analyzed within method specified holding times and according to NETLAB's documented standard operating procedures. The results for the associated calibration, method blank and laboratory control sample (LCS) were within method specified quality control requirements and allowances. Results for all soil samples, unless otherwise indicated, are reported on a dry weight basis.

Exceptions: None

Results: Total Metals

Sample: 1701230111-01

Lab Number: 3A12040-01 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	**0.007**		0.005	mg/L	01/13/23	01/18/23
Arsenic	ND		0.01	mg/L	01/13/23	01/18/23
Barium	**0.019**		0.005	mg/L	01/13/23	01/18/23
Beryllium	ND		0.005	mg/L	01/13/23	01/18/23
Cadmium	ND		0.005	mg/L	01/13/23	01/18/23
Chromium	ND		0.005	mg/L	01/13/23	01/18/23
Lead	ND		0.005	mg/L	01/13/23	01/18/23
Mercury	ND		0.0005	mg/L	01/13/23	01/18/23
Nickel	ND		0.005	mg/L	01/13/23	01/18/23
Selenium	ND		0.01	mg/L	01/13/23	01/18/23
Silver	ND		0.005	mg/L	01/13/23	01/18/23
Vanadium	ND		0.005	mg/L	01/13/23	01/18/23
Zinc	ND		0.020	mg/L	01/13/23	01/18/23
Thallium	ND		0.005	mg/L	01/13/23	01/18/23

Results: Total Metals

Sample: 1701230111-02

Lab Number: 3A12040-02 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	**0.009**		0.005	mg/L	01/13/23	01/18/23
Arsenic	ND		0.01	mg/L	01/13/23	01/18/23
Barium	**0.020**		0.005	mg/L	01/13/23	01/18/23
Beryllium	ND		0.005	mg/L	01/13/23	01/18/23
Cadmium	ND		0.005	mg/L	01/13/23	01/18/23
Chromium	ND		0.005	mg/L	01/13/23	01/18/23
Lead	ND		0.005	mg/L	01/13/23	01/18/23
Mercury	ND		0.0005	mg/L	01/13/23	01/18/23
Nickel	**0.008**		0.005	mg/L	01/13/23	01/18/23
Selenium	ND		0.01	mg/L	01/13/23	01/18/23
Silver	ND		0.005	mg/L	01/13/23	01/18/23
Vanadium	ND		0.005	mg/L	01/13/23	01/18/23
Zinc	ND		0.020	mg/L	01/13/23	01/18/23
Thallium	ND		0.005	mg/L	01/13/23	01/18/23

Results: Total Metals

Sample: 1701230111-03

Lab Number: 3A12040-03 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	**0.008**		0.005	mg/L	01/13/23	01/18/23
Arsenic	ND		0.01	mg/L	01/13/23	01/18/23
Barium	**0.025**		0.005	mg/L	01/13/23	01/18/23
Beryllium	ND		0.005	mg/L	01/13/23	01/18/23
Cadmium	ND		0.005	mg/L	01/13/23	01/18/23
Chromium	ND		0.005	mg/L	01/13/23	01/18/23
Lead	ND		0.005	mg/L	01/13/23	01/18/23
Mercury	ND		0.0005	mg/L	01/13/23	01/18/23
Nickel	**0.006**		0.005	mg/L	01/13/23	01/18/23
Selenium	ND		0.01	mg/L	01/13/23	01/18/23
Silver	ND		0.005	mg/L	01/13/23	01/18/23
Vanadium	ND		0.005	mg/L	01/13/23	01/18/23
Zinc	ND		0.020	mg/L	01/13/23	01/18/23
Thallium	ND		0.005	mg/L	01/13/23	01/18/23

Results: Total Metals

Sample: 1701230111-04

Lab Number: 3A12040-04 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.005	mg/L	01/13/23	01/18/23
Arsenic	ND		0.01	mg/L	01/13/23	01/18/23
Barium	**0.047**		0.005	mg/L	01/13/23	01/18/23
Beryllium	ND		0.005	mg/L	01/13/23	01/18/23
Cadmium	ND		0.005	mg/L	01/13/23	01/18/23
Chromium	**0.009**		0.005	mg/L	01/13/23	01/18/23
Lead	ND		0.005	mg/L	01/13/23	01/18/23
Mercury	ND		0.0005	mg/L	01/13/23	01/18/23
Nickel	**0.007**		0.005	mg/L	01/13/23	01/18/23
Selenium	ND		0.01	mg/L	01/13/23	01/18/23
Silver	ND		0.005	mg/L	01/13/23	01/18/23
Vanadium	**0.008**		0.005	mg/L	01/13/23	01/18/23
Zinc	ND		0.020	mg/L	01/13/23	01/18/23
Thallium	ND		0.005	mg/L	01/13/23	01/18/23

Results: Total Metals

Sample: 1701230111-05

Lab Number: 3A12040-05 (Water)

Analyte	Result	Qual	Reporting Limit	Units	Date Prepared	Date Analyzed
Antimony	ND		0.005	mg/L	01/13/23	01/18/23
Arsenic	ND		0.01	mg/L	01/13/23	01/18/23
Barium	**0.023**		0.005	mg/L	01/13/23	01/18/23
Beryllium	ND		0.005	mg/L	01/13/23	01/18/23
Cadmium	ND		0.005	mg/L	01/13/23	01/18/23
Chromium	ND		0.005	mg/L	01/13/23	01/18/23
Lead	ND		0.005	mg/L	01/13/23	01/18/23
Mercury	ND		0.0005	mg/L	01/13/23	01/18/23
Nickel	**0.008**		0.005	mg/L	01/13/23	01/18/23
Selenium	ND		0.01	mg/L	01/13/23	01/18/23
Silver	ND		0.005	mg/L	01/13/23	01/18/23
Vanadium	ND		0.005	mg/L	01/13/23	01/18/23
Zinc	ND		0.020	mg/L	01/13/23	01/18/23
Thallium	ND		0.005	mg/L	01/13/23	01/18/23

Volatile Petroleum Hydrocarbons
Sample: 1701230111-01 (3A12040-01)

SAMPLE INFORMATION

Matrix	Water		
Containers	Satisfactory		
Sample Preservation	Aqueous	pH<2	
	Soil or Sediment	NA	
		NA	
		Received in air-tight container	
Temperature	Received on Ice Received at: 4+/-2 C°		

VPH ANALYTICAL RESULTS

Method for Ranges: MADEP VPH-18-2.1				Client ID	1701230111-01	
Method for Target Analytes: MADEP VPH-18-2.1				Lab ID	3A12040-01	
VPH Surrogate Standards:				Date Collected	01/11/23	
PID: 2,5-Dibromotoluene				Date Received	01/12/23	
FID: 2,5-Dibromotoluene				% Moisture	NA	
RANGE/TARGET ANALYTE	**Elution Range**	**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C5-C8 Aliphatic Hydrocarbons [1]	NA	10X	1000	ug/l	**8870**	01/13/23 12:38
Unadjusted C9-C12 Aliphatic Hydrocarbons [1]	NA	10X	1000	ug/l	**15800**	01/13/23 12:38
Benzene	C5-C8	1X	5.0	ug/l	<5.0	01/13/23 12:38
Ethylbenzene	C9-C12	10X	50.0	ug/l	**1080**	01/13/23 12:38
Methyl t-butyl ether (MTBE)	C5-C8	1X	10.0	ug/l	<10.0	01/13/23 12:38
Naphthalene	NA	1X	10.0	ug/l	**163**	01/13/23 12:38
Toluene	C5-C8	10X	50.0	ug/l	**890**	01/13/23 12:38
m&p-Xylene	C9-C12	10X	100	ug/l	**1770**	01/13/23 12:38
o-Xylene	C9-C12	10X	100	ug/l	**611**	01/13/23 12:38
Total xylenes		10X	100	ug/l	**2390**	01/13/23 12:38
C5-C8 Aliphatic Hydrocarbons [1,2]	NA	1X	100	ug/l	**7980**	01/13/23 12:38
C9-C12 Aliphatic Hydrocarbons [1,3]	NA	1X	100	ug/l	**9360**	01/13/23 12:38
C9-C10 Aromatic Hydrocarbons [1]	NA	10X	1000	ug/l	**2930**	01/13/23 12:38
2,5-Dibromotoluene-PID				%	108	01/13/23 12:38
2,5-Dibromotoluene-FID				%	112	01/13/23 12:38
Surrogate Acceptance Range				%	70-130	

[1] Hydrocarbon Range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range
[2] C5-C8 Aliphatic Hydrocarbons exclude the concentration of Target Analytes eluting in that range
[3] C9-C12 Aliphatic Hydrocarbons exclude conc of Target Analytes eluting in that range AND concentration of C9-C10 Aromatic Hydrocarbons

Volatile Petroleum Hydrocarbons
Sample: 1701230111-02 (3A12040-02)

SAMPLE INFORMATION

Matrix	Water		
Containers	Satisfactory		
Sample Preservation	Aqueous	pH<2	
	Soil or Sediment	NA	
		NA	
		Received in air-tight container	
Temperature	Received on Ice Received at: 4+/-2 C°		

VPH ANALYTICAL RESULTS

Method for Ranges: MADEP VPH-18-2.1				Client ID	1701230111-02	
Method for Target Analytes: MADEP VPH-18-2.1				Lab ID	3A12040-02	
VPH Surrogate Standards:				Date Collected	01/11/23	
PID: 2,5-Dibromotoluene				Date Received	01/12/23	
FID: 2,5-Dibromotoluene				% Moisture	NA	
RANGE/TARGET ANALYTE	**Elution Range**	**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C5-C8 Aliphatic Hydrocarbons [1]	NA	1X	100	ug/l	**695**	01/13/23 11:35
Unadjusted C9-C12 Aliphatic Hydrocarbons [1]	NA	1X	100	ug/l	**1780**	01/13/23 11:35
Benzene	C5-C8	1X	5.0	ug/l	<5.0	01/13/23 11:35
Ethylbenzene	C9-C12	1X	5.0	ug/l	<5.0	01/13/23 11:35
Methyl t-butyl ether (MTBE)	C5-C8	1X	10.0	ug/l	<10.0	01/13/23 11:35
Naphthalene	NA	1X	10.0	ug/l	<10.0	01/13/23 11:35
Toluene	C5-C8	1X	5.0	ug/l	<5.0	01/13/23 11:35
m&p-Xylene	C9-C12	1X	10.0	ug/l	<10.0	01/13/23 11:35
o-Xylene	C9-C12	1X	10.0	ug/l	<10.0	01/13/23 11:35
Total xylenes		1X	10.0	ug/l	<10.0	01/13/23 11:35
C5-C8 Aliphatic Hydrocarbons [1,2]	NA	1X	100	ug/l	**695**	01/13/23 11:35
C9-C12 Aliphatic Hydrocarbons [1,3]	NA	1X	100	ug/l	**944**	01/13/23 11:35
C9-C10 Aromatic Hydrocarbons [1]	NA	1X	100	ug/l	**834**	01/13/23 11:35
2,5-Dibromotoluene-PID				%	104	01/13/23 11:35
2,5-Dibromotoluene-FID				%	110	01/13/23 11:35
Surrogate Acceptance Range				%	70-130	

[1] Hydrocarbon Range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range
[2] C5-C8 Aliphatic Hydrocarbons exclude the concentration of Target Analytes eluting in that range
[3] C9-C12 Aliphatic Hydrocarbons exclude conc of Target Analytes eluting in that range AND concentration of C9-C10 Aromatic Hydrocarbons

Volatile Petroleum Hydrocarbons
Sample: 1701230111-03 (3A12040-03)

SAMPLE INFORMATION

Matrix	Water	
Containers	Satisfactory	
Sample Preservation	Aqueous	pH<2
	Soil or Sediment	NA
		NA
		Received in air-tight container
Temperature	Received on Ice Received at: 4+/-2 C°	

VPH ANALYTICAL RESULTS

Method for Ranges: MADEP VPH-18-2.1			Client ID		1701230111-03	
Method for Target Analytes: MADEP VPH-18-2.1			Lab ID		3A12040-03	
VPH Surrogate Standards:			Date Collected		01/11/23	
PID: 2,5-Dibromotoluene			Date Received		01/12/23	
FID: 2,5-Dibromotoluene			% Moisture		NA	
RANGE/TARGET ANALYTE	**Elution Range**	**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C5-C8 Aliphatic Hydrocarbons [1]	NA	1X	100	ug/l	**1840**	01/13/23 12:08
Unadjusted C9-C12 Aliphatic Hydrocarbons [1]	NA	1X	100	ug/l	**2880**	01/13/23 12:08
Benzene	C5-C8	1X	5.0	ug/l	<5.0	01/13/23 12:08
Ethylbenzene	C9-C12	5X	25.0	ug/l	**193**	01/13/23 12:08
Methyl t-butyl ether (MTBE)	C5-C8	1X	10.0	ug/l	<10.0	01/13/23 12:08
Naphthalene	NA	1X	10.0	ug/l	**28.8**	01/13/23 12:08
Toluene	C5-C8	5X	25.0	ug/l	**337**	01/13/23 12:08
m&p-Xylene	C9-C12	1X	10.0	ug/l	**339**	01/13/23 12:08
o-Xylene	C9-C12	1X	10.0	ug/l	**55.1**	01/13/23 12:08
Total xylenes		1X	10.0	ug/l	**394**	01/13/23 12:08
C5-C8 Aliphatic Hydrocarbons [1,2]	NA	1X	100	ug/l	**1500**	01/13/23 12:08
C9-C12 Aliphatic Hydrocarbons [1,3]	NA	1X	100	ug/l	**1980**	01/13/23 12:08
C9-C10 Aromatic Hydrocarbons [1]	NA	1X	100	ug/l	**463**	01/13/23 12:08
2,5-Dibromotoluene-PID				%	105	01/13/23 12:08
2,5-Dibromotoluene-FID				%	110	01/13/23 12:08
Surrogate Acceptance Range				%	70-130	

[1] Hydrocarbon Range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range
[2] C5-C8 Aliphatic Hydrocarbons exclude the concentration of Target Analytes eluting in that range
[3] C9-C12 Aliphatic Hydrocarbons exclude conc of Target Analytes eluting in that range AND concentration of C9-C10 Aromatic Hydrocarbons

Volatile Petroleum Hydrocarbons
Sample: 1701230111-04 (3A12040-04)

SAMPLE INFORMATION

Matrix	Water		
Containers	Satisfactory		
Sample Preservation	Aqueous	pH<2	
	Soil or Sediment	NA	
		NA	
		Received in air-tight container	
Temperature	Received on Ice Received at: 4+/-2 C°		

VPH ANALYTICAL RESULTS

Method for Ranges: MADEP VPH-18-2.1				Client ID	1701230111-04	
Method for Target Analytes: MADEP VPH-18-2.1				Lab ID	3A12040-04	
VPH Surrogate Standards:				Date Collected	01/11/23	
PID: 2,5-Dibromotoluene				Date Received	01/12/23	
FID: 2,5-Dibromotoluene				% Moisture	NA	
RANGE/TARGET ANALYTE	**Elution Range**	**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C5-C8 Aliphatic Hydrocarbons [1]	NA	1X	100	ug/l	<100	01/13/23 10:29
Unadjusted C9-C12 Aliphatic Hydrocarbons [1]	NA	1X	100	ug/l	<100	01/13/23 10:29
Benzene	C5-C8	1X	5.0	ug/l	<5.0	01/13/23 10:29
Ethylbenzene	C9-C12	1X	5.0	ug/l	<5.0	01/13/23 10:29
Methyl t-butyl ether (MTBE)	C5-C8	1X	10.0	ug/l	<10.0	01/13/23 10:29
Naphthalene	NA	1X	10.0	ug/l	<10.0	01/13/23 10:29
Toluene	C5-C8	1X	5.0	ug/l	<5.0	01/13/23 10:29
m&p-Xylene	C9-C12	1X	10.0	ug/l	<10.0	01/13/23 10:29
o-Xylene	C9-C12	1X	10.0	ug/l	<10.0	01/13/23 10:29
Total xylenes		1X	10.0	ug/l	<10.0	01/13/23 10:29
C5-C8 Aliphatic Hydrocarbons [1,2]	NA	1X	100	ug/l	<100	01/13/23 10:29
C9-C12 Aliphatic Hydrocarbons [1,3]	NA	1X	100	ug/l	<100	01/13/23 10:29
C9-C10 Aromatic Hydrocarbons [1]	NA	1X	100	ug/l	<100	01/13/23 10:29
2,5-Dibromotoluene-PID				%	97.3	01/13/23 10:29
2,5-Dibromotoluene-FID				%	104	01/13/23 10:29
Surrogate Acceptance Range				%	70-130	

[1] Hydrocarbon Range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range
[2] C5-C8 Aliphatic Hydrocarbons exclude the concentration of Target Analytes eluting in that range
[3] C9-C12 Aliphatic Hydrocarbons exclude conc of Target Analytes eluting in that range AND concentration of C9-C10 Aromatic Hydrocarbons

Volatile Petroleum Hydrocarbons
Sample: 1701230111-05 (3A12040-05)

SAMPLE INFORMATION

Matrix	Water		
Containers	Satisfactory		
Sample Preservation	Aqueous	pH<2	
	Soil or Sediment	NA	
		NA	
		Received in air-tight container	
Temperature	Received on Ice Received at: 4+/-2 C°		

VPH ANALYTICAL RESULTS

Method for Ranges: MADEP VPH-18-2.1				Client ID	1701230111-05	
Method for Target Analytes: MADEP VPH-18-2.1				Lab ID	3A12040-05	
VPH Surrogate Standards:				Date Collected	01/11/23	
PID: 2,5-Dibromotoluene				Date Received	01/12/23	
FID: 2,5-Dibromotoluene				% Moisture	NA	
RANGE/TARGET ANALYTE	**Elution Range**	**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C5-C8 Aliphatic Hydrocarbons [1]	NA	1X	100	ug/l	**122**	01/13/23 11:02
Unadjusted C9-C12 Aliphatic Hydrocarbons [1]	NA	1X	100	ug/l	**293**	01/13/23 11:02
Benzene	C5-C8	1X	5.0	ug/l	<5.0	01/13/23 11:02
Ethylbenzene	C9-C12	1X	5.0	ug/l	**37.6**	01/13/23 11:02
Methyl t-butyl ether (MTBE)	C5-C8	1X	10.0	ug/l	<10.0	01/13/23 11:02
Naphthalene	NA	1X	10.0	ug/l	<10.0	01/13/23 11:02
Toluene	C5-C8	1X	5.0	ug/l	<5.0	01/13/23 11:02
m&p-Xylene	C9-C12	1X	10.0	ug/l	**15.1**	01/13/23 11:02
o-Xylene	C9-C12	1X	10.0	ug/l	<10.0	01/13/23 11:02
Total xylenes		1X	10.0	ug/l	**15.1**	01/13/23 11:02
C5-C8 Aliphatic Hydrocarbons [1,2]	NA	1X	100	ug/l	**122**	01/13/23 11:02
C9-C12 Aliphatic Hydrocarbons [1,3]	NA	1X	100	ug/l	**240**	01/13/23 11:02
C9-C10 Aromatic Hydrocarbons [1]	NA	1X	100	ug/l	<100	01/13/23 11:02
2,5-Dibromotoluene-PID				%	104	01/13/23 11:02
2,5-Dibromotoluene-FID				%	112	01/13/23 11:02
Surrogate Acceptance Range				%	70-130	

[1] Hydrocarbon Range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range
[2] C5-C8 Aliphatic Hydrocarbons exclude the concentration of Target Analytes eluting in that range
[3] C9-C12 Aliphatic Hydrocarbons exclude conc of Target Analytes eluting in that range AND concentration of C9-C10 Aromatic Hydrocarbons

Volatile Petroleum Hydrocarbons
Sample: 1701230111-06 (3A12040-06)

SAMPLE INFORMATION

Matrix	Water		
Containers	Satisfactory		
Sample Preservation	Aqueous	pH<2	
	Soil or Sediment	NA	
		NA	
		Received in air-tight container	
Temperature	Received on Ice Received at: 4+/-2 C°		

VPH ANALYTICAL RESULTS

Method for Ranges: MADEP VPH-18-2.1				Client ID	1701230111-06	
Method for Target Analytes: MADEP VPH-18-2.1				Lab ID	3A12040-06	
VPH Surrogate Standards:				Date Collected	01/11/23	
PID: 2,5-Dibromotoluene				Date Received	01/12/23	
FID: 2,5-Dibromotoluene				% Moisture	NA	
RANGE/TARGET ANALYTE	**Elution Range**	**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C5-C8 Aliphatic Hydrocarbons [1]	NA	1X	100	ug/l	<100	01/13/23 09:56
Unadjusted C9-C12 Aliphatic Hydrocarbons [1]	NA	1X	100	ug/l	<100	01/13/23 09:56
Benzene	C5-C8	1X	5.0	ug/l	<5.0	01/13/23 09:56
Ethylbenzene	C9-C12	1X	5.0	ug/l	<5.0	01/13/23 09:56
Methyl t-butyl ether (MTBE)	C5-C8	1X	10.0	ug/l	<10.0	01/13/23 09:56
Naphthalene	NA	1X	10.0	ug/l	<10.0	01/13/23 09:56
Toluene	C5-C8	1X	5.0	ug/l	<5.0	01/13/23 09:56
m&p-Xylene	C9-C12	1X	10.0	ug/l	<10.0	01/13/23 09:56
o-Xylene	C9-C12	1X	10.0	ug/l	<10.0	01/13/23 09:56
Total xylenes		1X	10.0	ug/l	<10.0	01/13/23 09:56
C5-C8 Aliphatic Hydrocarbons [1,2]	NA	1X	100	ug/l	<100	01/13/23 09:56
C9-C12 Aliphatic Hydrocarbons [1,3]	NA	1X	100	ug/l	<100	01/13/23 09:56
C9-C10 Aromatic Hydrocarbons [1]	NA	1X	100	ug/l	<100	01/13/23 09:56
2,5-Dibromotoluene-PID				%	95.3	01/13/23 09:56
2,5-Dibromotoluene-FID				%	102	01/13/23 09:56
Surrogate Acceptance Range				%	70-130	

[1] Hydrocarbon Range data excludes concentrations of any surrogate(s) and/or internal standards eluting in that range
[2] C5-C8 Aliphatic Hydrocarbons exclude the concentration of Target Analytes eluting in that range
[3] C9-C12 Aliphatic Hydrocarbons exclude conc of Target Analytes eluting in that range AND concentration of C9-C10 Aromatic Hydrocarbons

Extractable Petroleum Hydrocarbons
Sample: 1701230111-01 (3A12040-01)

SAMPLE INFORMATION

Matrix	Water
Containers	Satisfactory
Aqueous Preservatives	pH<2
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3510C

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1				Client ID	1701230111-01	
Method for Target Analytes: MADEP EPH 4-1.1				Lab ID	3A12040-01	
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl				Date Collected	01/11/23	
				Date Received	01/12/23	
				Date Thawed	NA	
				Date Extracted	01/17/23	
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene				Percent Moisture	NA	
RANGE/TARGET ANALYTE		**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	100	ug/l	**157**	01/19/23 04:13
Diesel PAH Analytes	Naphthalene	1X	1.0	ug/l	**50.2**	01/19/23 04:13
	2-Methylnaphthalene	1X	1.0	ug/l	**11.0**	01/19/23 04:13
	Phenanthrene	1X	1.0	ug/l	<1.0	01/19/23 04:13
	Acenaphthene	1X	5.0	ug/l	<5.0	01/19/23 04:13
Other Target PAH Analytes	Acenaphthylene	1X	1.0	ug/l	<1.0	01/19/23 04:13
	Fluorene	1X	5.0	ug/l	<5.0	01/19/23 04:13
	Anthracene	1X	5.0	ug/l	<5.0	01/19/23 04:13
	Fluoranthene	1X	5.0	ug/l	<5.0	01/19/23 04:13
	Pyrene	1X	5.0	ug/l	<5.0	01/19/23 04:13
	Benzo(a)anthracene	1X	1.0	ug/l	<1.0	01/19/23 04:13
	Chrysene	1X	2.0	ug/l	<2.0	01/19/23 04:13
	Benzo(b)fluoranthene	1X	1.0	ug/l	<1.0	01/19/23 04:13
	Benzo(k)fluoranthene	1X	1.0	ug/l	<1.0	01/19/23 04:13
	Benzo(a)pyrene	1X	0.2	ug/l	<0.2	01/19/23 04:13
	Indeno(1,2,3-cd)pyrene	1X	0.5	ug/l	<0.5	01/19/23 04:13
	Dibenz(a,h)anthracene	1X	0.5	ug/l	<0.5	01/19/23 04:13
	Benzo(g,h,i)perylene	1X	5.0	ug/l	<5.0	01/19/23 04:13
C9-C18 Aliphatic Hydrocarbons [1]		1X	200	ug/l	<200	01/20/23 13:05
C19-C36 Aliphatic Hydrocarbons [1]		1X	200	ug/l	<200	01/20/23 13:05
C11-C22 Aromatic Hydrocarbons [1,2]		1X	100	ug/l	<100	01/19/23 04:13
Chlorooctadecane (Sample Surrogate)				%	46.6	01/20/23 13:05
o-Terphenyl (Sample Surrogate)				%	41.3	01/19/23 04:13
2-Fluorobiphenyl (Fractionation Surrogate)				%	76.8	01/19/23 04:13
2-Bromonaphthalene (Fractionation Surrogate)				%	75.8	01/19/23 04:13
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: 1701230111-02 (3A12040-02)

SAMPLE INFORMATION

Matrix	Water
Containers	Satisfactory
Aqueous Preservatives	pH<2
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3510C

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1				Client ID	1701230111-02	
Method for Target Analytes: MADEP EPH 4-1.1				Lab ID	3A12040-02	
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl				Date Collected	01/11/23	
				Date Received	01/12/23	
				Date Thawed	NA	
				Date Extracted	01/17/23	
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene				Percent Moisture	NA	
RANGE/TARGET ANALYTE		**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	100	ug/l	**128**	01/19/23 04:36
Diesel PAH Analytes	Naphthalene	1X	1.0	ug/l	**7.8**	01/19/23 04:36
	2-Methylnaphthalene	1X	1.0	ug/l	**4.8**	01/19/23 04:36
	Phenanthrene	1X	1.0	ug/l	<1.0	01/19/23 04:36
	Acenaphthene	1X	5.0	ug/l	<5.0	01/19/23 04:36
Other Target PAH Analytes	Acenaphthylene	1X	1.0	ug/l	<1.0	01/19/23 04:36
	Fluorene	1X	5.0	ug/l	<5.0	01/19/23 04:36
	Anthracene	1X	5.0	ug/l	<5.0	01/19/23 04:36
	Fluoranthene	1X	5.0	ug/l	<5.0	01/19/23 04:36
	Pyrene	1X	5.0	ug/l	<5.0	01/19/23 04:36
	Benzo(a)anthracene	1X	1.0	ug/l	<1.0	01/19/23 04:36
	Chrysene	1X	2.0	ug/l	<2.0	01/19/23 04:36
	Benzo(b)fluoranthene	1X	1.0	ug/l	<1.0	01/19/23 04:36
	Benzo(k)fluoranthene	1X	1.0	ug/l	<1.0	01/19/23 04:36
	Benzo(a)pyrene	1X	0.2	ug/l	<0.2	01/19/23 04:36
	Indeno(1,2,3-cd)pyrene	1X	0.5	ug/l	<0.5	01/19/23 04:36
	Dibenz(a,h)anthracene	1X	0.5	ug/l	<0.5	01/19/23 04:36
	Benzo(g,h,i)perylene	1X	5.0	ug/l	<5.0	01/19/23 04:36
C9-C18 Aliphatic Hydrocarbons [1]		1X	200	ug/l	<200	01/20/23 14:28
C19-C36 Aliphatic Hydrocarbons [1]		1X	200	ug/l	<200	01/20/23 14:28
C11-C22 Aromatic Hydrocarbons [1,2]		1X	100	ug/l	**115**	01/19/23 04:36
Chlorooctadecane (Sample Surrogate)				%	51.5	01/20/23 14:28
o-Terphenyl (Sample Surrogate)				%	66.7	01/19/23 04:36
2-Fluorobiphenyl (Fractionation Surrogate)				%	90.3	01/19/23 04:36
2-Bromonaphthalene (Fractionation Surrogate)				%	89.3	01/19/23 04:36
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: 1701230111-03 (3A12040-03)

SAMPLE INFORMATION

Matrix	Water
Containers	Satisfactory
Aqueous Preservatives	pH<2
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3510C

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1				Client ID	1701230111-03	
Method for Target Analytes: MADEP EPH 4-1.1				Lab ID	3A12040-03	
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl				Date Collected	01/11/23	
				Date Received	01/12/23	
				Date Thawed	NA	
				Date Extracted	01/17/23	
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene				Percent Moisture	NA	
RANGE/TARGET ANALYTE		**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	100	ug/l	**122**	01/19/23 04:59
Diesel PAH Analytes	Naphthalene	1X	1.0	ug/l	**24.2**	01/19/23 04:59
	2-Methylnaphthalene	1X	1.0	ug/l	**3.8**	01/19/23 04:59
	Phenanthrene	1X	1.0	ug/l	<1.0	01/19/23 04:59
	Acenaphthene	1X	5.0	ug/l	<5.0	01/19/23 04:59
Other Target PAH Analytes	Acenaphthylene	1X	1.0	ug/l	<1.0	01/19/23 04:59
	Fluorene	1X	5.0	ug/l	<5.0	01/19/23 04:59
	Anthracene	1X	5.0	ug/l	<5.0	01/19/23 04:59
	Fluoranthene	1X	5.0	ug/l	<5.0	01/19/23 04:59
	Pyrene	1X	5.0	ug/l	<5.0	01/19/23 04:59
	Benzo(a)anthracene	1X	1.0	ug/l	<1.0	01/19/23 04:59
	Chrysene	1X	2.0	ug/l	<2.0	01/19/23 04:59
	Benzo(b)fluoranthene	1X	1.0	ug/l	<1.0	01/19/23 04:59
	Benzo(k)fluoranthene	1X	1.0	ug/l	<1.0	01/19/23 04:59
	Benzo(a)pyrene	1X	0.2	ug/l	<0.2	01/19/23 04:59
	Indeno(1,2,3-cd)pyrene	1X	0.5	ug/l	<0.5	01/19/23 04:59
	Dibenz(a,h)anthracene	1X	0.5	ug/l	<0.5	01/19/23 04:59
	Benzo(g,h,i)perylene	1X	5.0	ug/l	<5.0	01/19/23 04:59
C9-C18 Aliphatic Hydrocarbons [1]		1X	200	ug/l	<200	01/19/23 08:53
C19-C36 Aliphatic Hydrocarbons [1]		1X	200	ug/l	<200	01/19/23 08:53
C11-C22 Aromatic Hydrocarbons [1,2]		1X	100	ug/l	<100	01/19/23 04:59
Chlorooctadecane (Sample Surrogate)				%	46.9	01/19/23 08:53
o-Terphenyl (Sample Surrogate)				%	81.0	01/19/23 04:59
2-Fluorobiphenyl (Fractionation Surrogate)				%	88.9	01/19/23 04:59
2-Bromonaphthalene (Fractionation Surrogate)				%	87.2	01/19/23 04:59
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: 1701230111-04 (3A12040-04)

SAMPLE INFORMATION

Matrix	Water
Containers	Satisfactory
Aqueous Preservatives	pH<2
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3510C

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1				Client ID	1701230111-04	
Method for Target Analytes: MADEP EPH 4-1.1				Lab ID	3A12040-04	
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl				Date Collected	01/11/23	
				Date Received	01/12/23	
				Date Thawed	NA	
				Date Extracted	01/18/23	
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene				Percent Moisture	NA	
RANGE/TARGET ANALYTE		**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	100	ug/l	**121**	01/19/23 16:59
Diesel PAH Analytes	Naphthalene	1X	1.0	ug/l	<1.0	01/19/23 16:59
	2-Methylnaphthalene	1X	1.0	ug/l	<1.0	01/19/23 16:59
	Phenanthrene	1X	1.0	ug/l	<1.0	01/19/23 16:59
	Acenaphthene	1X	5.0	ug/l	<5.0	01/19/23 16:59
Other Target PAH Analytes	Acenaphthylene	1X	1.0	ug/l	<1.0	01/19/23 16:59
	Fluorene	1X	5.0	ug/l	<5.0	01/19/23 16:59
	Anthracene	1X	5.0	ug/l	<5.0	01/19/23 16:59
	Fluoranthene	1X	5.0	ug/l	<5.0	01/19/23 16:59
	Pyrene	1X	5.0	ug/l	<5.0	01/19/23 16:59
	Benzo(a)anthracene	1X	1.0	ug/l	<1.0	01/19/23 16:59
	Chrysene	1X	2.0	ug/l	<2.0	01/19/23 16:59
	Benzo(b)fluoranthene	1X	1.0	ug/l	<1.0	01/19/23 16:59
	Benzo(k)fluoranthene	1X	1.0	ug/l	<1.0	01/19/23 16:59
	Benzo(a)pyrene	1X	0.2	ug/l	<0.2	01/19/23 16:59
	Indeno(1,2,3-cd)pyrene	1X	0.5	ug/l	<0.5	01/19/23 16:59
	Dibenz(a,h)anthracene	1X	0.5	ug/l	<0.5	01/19/23 16:59
	Benzo(g,h,i)perylene	1X	5.0	ug/l	<5.0	01/19/23 16:59
C9-C18 Aliphatic Hydrocarbons [1]		1X	200	ug/l	<200	01/19/23 22:40
C19-C36 Aliphatic Hydrocarbons [1]		1X	200	ug/l	<200	01/19/23 22:40
C11-C22 Aromatic Hydrocarbons [1,2]		1X	100	ug/l	**121**	01/19/23 16:59
Chlorooctadecane (Sample Surrogate)				%	43.5	01/19/23 22:40
o-Terphenyl (Sample Surrogate)				%	78.7	01/19/23 16:59
2-Fluorobiphenyl (Fractionation Surrogate)				%	89.0	01/19/23 16:59
2-Bromonaphthalene (Fractionation Surrogate)				%	88.2	01/19/23 16:59
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Extractable Petroleum Hydrocarbons
Sample: 1701230111-05 (3A12040-05)

SAMPLE INFORMATION

Matrix	Water
Containers	Satisfactory
Aqueous Preservatives	pH<2
Temperature	Received on Ice Received at: 4+/-2 C°
Extraction Method	EPA Method 3510C

EPH ANALYTICAL RESULTS

Method for Ranges: MADEP EPH 4-1.1				Client ID	1701230111-05	
Method for Target Analytes: MADEP EPH 4-1.1				Lab ID	3A12040-05	
EPH Surrogate Standards: Aliphatic: Chlorooctadecane Aromatic: o-Terphenyl				Date Collected	01/11/23	
				Date Received	01/12/23	
				Date Thawed	NA	
				Date Extracted	01/18/23	
EPH Fractionation Surrogates: (1) 2-Fluorobiphenyl (2) 2-Bromonaphthalene				Percent Moisture	NA	
RANGE/TARGET ANALYTE		**Dilution**	**RL**	**Units**	**Result**	**Analyzed**
Unadjusted C11-C22 Aromatic Hydrocarbons [1]		1X	100	ug/l	**118**	01/19/23 17:22
Diesel PAH Analytes	Naphthalene	1X	1.0	ug/l	**3.2**	01/19/23 17:22
	2-Methylnaphthalene	1X	1.0	ug/l	<1.0	01/19/23 17:22
	Phenanthrene	1X	1.0	ug/l	<1.0	01/19/23 17:22
	Acenaphthene	1X	5.0	ug/l	<5.0	01/19/23 17:22
Other Target PAH Analytes	Acenaphthylene	1X	1.0	ug/l	<1.0	01/19/23 17:22
	Fluorene	1X	5.0	ug/l	<5.0	01/19/23 17:22
	Anthracene	1X	5.0	ug/l	<5.0	01/19/23 17:22
	Fluoranthene	1X	5.0	ug/l	<5.0	01/19/23 17:22
	Pyrene	1X	5.0	ug/l	<5.0	01/19/23 17:22
	Benzo(a)anthracene	1X	1.0	ug/l	<1.0	01/19/23 17:22
	Chrysene	1X	2.0	ug/l	<2.0	01/19/23 17:22
	Benzo(b)fluoranthene	1X	1.0	ug/l	<1.0	01/19/23 17:22
	Benzo(k)fluoranthene	1X	1.0	ug/l	<1.0	01/19/23 17:22
	Benzo(a)pyrene	1X	0.2	ug/l	<0.2	01/19/23 17:22
	Indeno(1,2,3-cd)pyrene	1X	0.5	ug/l	<0.5	01/19/23 17:22
	Dibenz(a,h)anthracene	1X	0.5	ug/l	<0.5	01/19/23 17:22
	Benzo(g,h,i)perylene	1X	5.0	ug/l	<5.0	01/19/23 17:22
C9-C18 Aliphatic Hydrocarbons [1]		1X	200	ug/l	<200	01/19/23 23:04
C19-C36 Aliphatic Hydrocarbons [1]		1X	200	ug/l	<200	01/19/23 23:04
C11-C22 Aromatic Hydrocarbons [1,2]		1X	100	ug/l	**115**	01/19/23 17:22
Chlorooctadecane (Sample Surrogate)				%	44.0	01/19/23 23:04
o-Terphenyl (Sample Surrogate)				%	82.0	01/19/23 17:22
2-Fluorobiphenyl (Fractionation Surrogate)				%	96.1	01/19/23 17:22
2-Bromonaphthalene (Fractionation Surrogate)				%	95.2	01/19/23 17:22
Surrogate Acceptance Range [3]				%	40 - 140	

[1] Hydrocarbon range data excludes area counts of any surrogate(s) and/or internal standards eluting in that range.
[2] C11-C22 Aromatic Hydrocarbons excludes the concentration of Target PAH Analytes.
[3] See the case narrative in cases where a dash (-) is entered in the surrogate recovery block.

Quality Control

Total Metals

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B3A0535 - Metals Digestion Waters										
Blank (B3A0535-BLK1)					Prepared: 01/13/23 Analyzed: 01/18/23					
Selenium	ND		0.01	mg/L						
Nickel	ND		0.005	mg/L						
Silver	ND		0.005	mg/L						
Cadmium	ND		0.005	mg/L						
Barium	ND		0.005	mg/L						
Antimony	ND		0.005	mg/L						
Chromium	ND		0.005	mg/L						
Beryllium	ND		0.005	mg/L						
Lead	ND		0.005	mg/L						
Vanadium	ND		0.005	mg/L						
Arsenic	ND		0.01	mg/L						
Zinc	ND		0.020	mg/L						
Thallium	ND		0.005	mg/L						
LCS (B3A0535-BS1)					Prepared: 01/13/23 Analyzed: 01/18/23					
Arsenic	0.21		0.01	mg/L	0.200		104	85-115		
Silver	0.428		0.005	mg/L	0.400		107	85-115		
Cadmium	1.02		0.005	mg/L	1.00		102	85-114		
Beryllium	0.209		0.005	mg/L	0.200		104	85-115		
Chromium	1.01		0.005	mg/L	1.00		101	85-115		
Lead	0.984		0.005	mg/L	1.00		98.4	85-115		
Antimony	1.09		0.005	mg/L	1.00		109	85-115		
Selenium	0.21		0.01	mg/L	0.200		106	85-115		
Vanadium	1.02		0.005	mg/L	1.00		102	85-115		
Zinc	1.05		0.020	mg/L	1.00		105	85-115		
Nickel	0.998		0.005	mg/L	1.00		99.8	85-112		
Barium	0.994		0.005	mg/L	1.00		99.4	85-115		
Thallium	1.02		0.005	mg/L	1.00		102	85-115		

Quality Control
(Continued)

Total Metals (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B3A0553 - Metals Cold-Vapor Mercury										
Blank (B3A0553-BLK1)					Prepared: 01/13/23	Analyzed: 01/18/23				
Mercury	ND		0.0005	mg/L						
LCS (B3A0553-BS1)					Prepared: 01/13/23	Analyzed: 01/18/23				
Mercury	0.0049		0.0005	mg/L	0.00500		97.9	85-115		

Quality Control
(Continued)

Volatile Petroleum Hydrocarbons (MADEP-VPH)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B3A0520 - MADEP VPH										
Blank (B3A0520-BLK1)					Prepared & Analyzed: 01/13/23					
Unadjusted C5-C8 Aliphatic Hydrocarbons	ND		100	ug/l						
Unadjusted C9-C12 Aliphatic Hydrocarbons	ND		100	ug/l						
Benzene	ND		5.0	ug/l						
Ethylbenzene	ND		5.0	ug/l						
Methyl t-butyl ether (MTBE)	ND		10.0	ug/l						
Naphthalene	ND		10.0	ug/l						
Toluene	ND		5.0	ug/l						
m&p-Xylene	ND		10.0	ug/l						
o-Xylene	ND		10.0	ug/l						
Total xylenes	ND		10.0	ug/l						
C5-C8 Aliphatic Hydrocarbons	ND		100	ug/l						
C9-C12 Aliphatic Hydrocarbons	ND		100	ug/l						
C9-C10 Aromatic Hydrocarbons	ND		100	ug/l						
Surrogate: 2,5- Dibromotoluene-PID			*46.4*	ug/l	*50.0*		*92.9*	*70-130*		
Surrogate: 2,5- Dibromotoluene-FID			*49.9*	ug/l	*50.0*		*99.8*	*70-130*		
LCS (B3A0520-BS1)					Prepared & Analyzed: 01/13/23					
Benzene	58.7		5.0	ug/l	50.0		117	70-130		
Ethylbenzene	53.4		5.0	ug/l	50.0		107	70-130		
Methyl t-butyl ether (MTBE)	54.1		10.0	ug/l	50.0		108	70-130		
Naphthalene	42.6		10.0	ug/l	50.0		85.2	70-130		
Toluene	56.0		5.0	ug/l	50.0		112	70-130		
m&p-Xylene	102		10.0	ug/l	100		102	70-130		
2-Methylpentane	63.1		5.0	ug/l	50.0		126	70-130		
n-Nonane	44.7		5.0	ug/l	50.0		89.5	70-130		
o-Xylene	50.4		10.0	ug/l	50.0		101	70-130		
Decane	39.0		5.0	ug/l	50.0		78.1	70-130		
n-Butylcylohexane	45.3		5.0	ug/l	50.0		90.5	70-130		
n-Pentane	65.0		5.0	ug/l	50.0		130	70-130		
1,2,4-Trimethylbenzene	45.8		10.0	ug/l	50.0		91.6	70-130		
VPH_LCS_Aliphatic_C5-C8	190		5.0	ug/l	150		126	70-130		
VPH_LCS_Aliphatic_C9-C12	84.3		10.0	ug/l	100		84.3	70-130		
VPH_LCS_Aromatic_C9-C10	45.8		10.0	ug/l	50.0		91.6	70-130		
Surrogate: 2,5- Dibromotoluene-PID			*46.7*	ug/l	*50.0*		*93.3*	*70-130*		
Surrogate: 2,5- Dibromotoluene-FID			*49.8*	ug/l	*50.0*		*99.5*	*70-130*		

Quality Control
(Continued)

Volatile Petroleum Hydrocarbons (MADEP-VPH) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B3A0520 - MADEP VPH (Continued)										
LCS Dup (B3A0520-BSD1)					Prepared & Analyzed: 01/13/23					
Benzene	56.8		5.0	ug/l	50.0		114	70-130	3.26	25
Ethylbenzene	52.5		5.0	ug/l	50.0		105	70-130	1.76	25
Methyl t-butyl ether (MTBE)	51.9		10.0	ug/l	50.0		104	70-130	4.28	25
Naphthalene	44.0		10.0	ug/l	50.0		88.1	70-130	3.35	25
Toluene	54.3		5.0	ug/l	50.0		109	70-130	2.97	25
m&p-Xylene	101		10.0	ug/l	100		101	70-130	1.44	25
2-Methylpentane	60.1		5.0	ug/l	50.0		120	70-130	4.95	25
o-Xylene	49.8		10.0	ug/l	50.0		99.6	70-130	1.14	25
n-Nonane	42.9		5.0	ug/l	50.0		85.8	70-130	4.25	25
Decane	38.9		5.0	ug/l	50.0		77.8	70-130	0.411	25
n-Butylcylohexane	42.7		5.0	ug/l	50.0		85.4	70-130	5.80	25
n-Pentane	61.8		5.0	ug/l	50.0		124	70-130	5.05	25
1,2,4-Trimethylbenzene	46.0		10.0	ug/l	50.0		91.9	70-130	0.371	25
VPH_LCS_Aliphatic_C5-C8	180		5.0	ug/l	150		120	70-130	5.01	25
VPH_LCS_Aliphatic_C9-C12	81.6		10.0	ug/l	100		81.6	70-130	3.27	25
VPH_LCS_Aromatic_C9-C10	46.0		10.0	ug/l	50.0		91.9	70-130	0.371	25
Surrogate: 2,5- Dibromotoluene-PID			*46.9*	ug/l	*50.0*		*93.7*	*70-130*		
Surrogate: 2,5- Dibromotoluene-FID			*49.7*	ug/l	*50.0*		*99.3*	*70-130*		

Quality Control
(Continued)

Extractable Petroleum Hydrocarbons (MADEP-EPH)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B3A0706 - Sep-Funnel-extraction										
Blank (B3A0706-BLK1)					Prepared: 01/17/23 Analyzed: 01/18/23					
Unadjusted C11-C22 Aromatic Hydrocarbons	ND		100	ug/l						
Naphthalene	ND		1.0	ug/l						
2-Methylnaphthalene	ND		1.0	ug/l						
Phenanthrene	ND		1.0	ug/l						
Acenaphthene	ND		5.0	ug/l						
Acenaphthylene	ND		1.0	ug/l						
Fluorene	ND		5.0	ug/l						
Anthracene	ND		5.0	ug/l						
Fluoranthene	ND		5.0	ug/l						
Pyrene	ND		5.0	ug/l						
Benzo(a)anthracene	ND		1.0	ug/l						
Chrysene	ND		2.0	ug/l						
Benzo(b)fluoranthene	ND		1.0	ug/l						
Benzo(k)fluoranthene	ND		1.0	ug/l						
Benzo(a)pyrene	ND		0.2	ug/l						
Indeno(1,2,3-cd)pyrene	ND		0.5	ug/l						
Dibenz(a,h)anthracene	ND		0.5	ug/l						
Benzo(g,h,i)perylene	ND		5.0	ug/l						
C9-C18 Aliphatic Hydrocarbons	ND		200	ug/l						
C19-C36 Aliphatic Hydrocarbons	ND		200	ug/l						
C11-C22 Aromatic Hydrocarbons	ND		100	ug/l						
Surrogate: Chlorooctadecane			*58.5*	ug/l	*125*		*46.8*	*40-140*		
Surrogate: o-Terphenyl			*68.6*	ug/l	*125*		*54.9*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*41.0*	ug/l	*50.0*		*81.9*	*40-140*		
Surrogate: 2-Bromonaphthalene			*40.4*	ug/l	*50.0*		*80.8*	*40-140*		
LCS (B3A0706-BS1)					Prepared: 01/17/23 Analyzed: 01/19/23					
Naphthalene	29.0		1.0	ug/l	40.0		72.4	40-140		
2-Methylnaphthalene	29.1		1.0	ug/l	40.0		72.8	40-140		
Phenanthrene	38.1		1.0	ug/l	40.0		95.2	40-140		
Acenaphthene	29.7		5.0	ug/l	40.0		74.3	40-140		
Acenaphthylene	29.7		1.0	ug/l	40.0		74.2	40-140		
Fluorene	30.9		5.0	ug/l	40.0		77.2	40-140		
Anthracene	32.0		5.0	ug/l	40.0		80.0	40-140		
Fluoranthene	34.3		5.0	ug/l	40.0		85.8	40-140		
Pyrene	34.0		5.0	ug/l	40.0		85.0	40-140		
Benzo(a)anthracene	33.9		1.0	ug/l	40.0		84.8	40-140		
Chrysene	34.4		2.0	ug/l	40.0		86.1	40-140		
Benzo(b)fluoranthene	38.4		1.0	ug/l	40.0		96.0	40-140		
Benzo(k)fluoranthene	33.2		1.0	ug/l	40.0		83.0	40-140		
Benzo(a)pyrene	32.2		0.2	ug/l	40.0		80.4	40-140		
Indeno(1,2,3-cd)pyrene	29.6		0.5	ug/l	40.0		74.0	40-140		
Dibenz(a,h)anthracene	29.7		0.5	ug/l	40.0		74.2	40-140		
Benzo(g,h,i)perylene	31.9		5.0	ug/l	40.0		79.8	40-140		
Nonane	13.9		5.0	ug/l	40.0		34.7	30-140		
Decane	19.0		5.0	ug/l	40.0		47.6	40-140		
Dodecane	22.2		5.0	ug/l	40.0		55.5	40-140		
Tetradecane	22.6		5.0	ug/l	40.0		56.4	40-140		
Hexadecane	24.0		5.0	ug/l	40.0		60.0	40-140		
Octadecane	27.0		5.0	ug/l	40.0		67.5	40-140		
Nonadecane	28.2		5.0	ug/l	40.0		70.5	40-140		
Eicosane	29.1		5.0	ug/l	40.0		72.6	40-140		
Docosane	30.0		5.0	ug/l	40.0		75.0	40-140		
Tetracosane	30.4		5.0	ug/l	40.0		75.9	40-140		
Hexacosane	30.3		5.0	ug/l	40.0		75.7	40-140		
Octacosane	29.7		5.0	ug/l	40.0		74.3	40-140		
Triacontane	28.7		5.0	ug/l	40.0		71.7	40-140		

Extractable Petroleum Hydrocarbons (MADEP-EPH) (Continued)

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch: B3A0706 - Sep-Funnel-extraction (Continued)										
LCS (B3A0706-BS1)					Prepared: 01/17/23 Analyzed: 01/19/23					
Hexatriacontane	25.4		5.0	ug/l	40.0		63.6	40-140		
EPH_LCS_Aliphatic_C19-C36	232		0.0	ug/l	320		72.4	40-140		
EPH_LCS_Aliphatic_C9-C18	129		0.0	ug/l	240		53.6	40-140		
EPH_LCS_Aromatic_C11-C22	550		0.0	ug/l	680		80.9	40-140		
Surrogate: Chlorooctadecane			*51.6*	ug/l	*125*		*41.2*	*40-140*		
Surrogate: o-Terphenyl			*96.0*	ug/l	*125*		*76.8*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*45.5*	ug/l	*50.0*		*91.0*	*40-140*		
Surrogate: 2-Bromonaphthalene			*45.2*	ug/l	*50.0*		*90.3*	*40-140*		
LCS Dup (B3A0706-BSD1)					Prepared: 01/17/23 Analyzed: 01/18/23					
Naphthalene	33.8		1.0	ug/l	40.0		84.4	40-140	15.4	25
2-Methylnaphthalene	34.1		1.0	ug/l	40.0		85.2	40-140	15.7	25
Phenanthrene	44.7		1.0	ug/l	40.0		112	40-140	16.0	25
Acenaphthene	34.7		5.0	ug/l	40.0		86.8	40-140	15.5	25
Acenaphthylene	34.6		1.0	ug/l	40.0		86.5	40-140	15.4	25
Fluorene	36.4		5.0	ug/l	40.0		90.9	40-140	16.3	25
Anthracene	37.5		5.0	ug/l	40.0		93.8	40-140	15.8	25
Fluoranthene	40.8		5.0	ug/l	40.0		102	40-140	17.2	25
Pyrene	40.2		5.0	ug/l	40.0		101	40-140	16.8	25
Benzo(a)anthracene	40.7		1.0	ug/l	40.0		102	40-140	18.3	25
Chrysene	41.2		2.0	ug/l	40.0		103	40-140	17.9	25
Benzo(b)fluoranthene	46.2		1.0	ug/l	40.0		116	40-140	18.4	25
Benzo(k)fluoranthene	39.5		1.0	ug/l	40.0		98.8	40-140	17.4	25
Benzo(a)pyrene	38.7		0.2	ug/l	40.0		96.8	40-140	18.5	25
Indeno(1,2,3-cd)pyrene	37.1		0.5	ug/l	40.0		92.8	40-140	22.4	25
Dibenz(a,h)anthracene	36.0		0.5	ug/l	40.0		90.0	40-140	19.3	25
Benzo(g,h,i)perylene	38.3		5.0	ug/l	40.0		95.7	40-140	18.1	25
Nonane	14.0		5.0	ug/l	40.0		35.0	30-140	0.789	25
Decane	18.9		5.0	ug/l	40.0		47.2	40-140	0.633	25
Dodecane	22.2		5.0	ug/l	40.0		55.6	40-140	0.0900	25
Tetradecane	22.6		5.0	ug/l	40.0		56.4	40-140	0.00	25
Hexadecane	24.0		5.0	ug/l	40.0		59.9	40-140	0.125	25
Octadecane	27.1		5.0	ug/l	40.0		67.6	40-140	0.185	25
Nonadecane	28.3		5.0	ug/l	40.0		70.8	40-140	0.389	25
Eicosane	29.2		5.0	ug/l	40.0		73.0	40-140	0.446	25
Docosane	30.1		5.0	ug/l	40.0		75.3	40-140	0.466	25
Tetracosane	30.5		5.0	ug/l	40.0		76.2	40-140	0.362	25
Hexacosane	30.4		5.0	ug/l	40.0		75.9	40-140	0.231	25
Octacosane	29.8		5.0	ug/l	40.0		74.4	40-140	0.202	25
Triacontane	28.8		5.0	ug/l	40.0		71.9	40-140	0.279	25
Hexatriacontane	25.7		5.0	ug/l	40.0		64.3	40-140	1.10	25
EPH_LCS_Aliphatic_C19-C36	233		0.0	ug/l	320		72.7	40-140	0.422	25
EPH_LCS_Aliphatic_C9-C18	129		0.0	ug/l	240		53.6	40-140	0.0233	25
EPH_LCS_Aromatic_C11-C22	655		0.0	ug/l	680		96.3	40-140	17.3	25
Surrogate: Chlorooctadecane			*52.0*	ug/l	*125*		*41.6*	*40-140*		
Surrogate: o-Terphenyl			*113*	ug/l	*125*		*90.5*	*40-140*		
Surrogate: 2-Fluorobiphenyl			*53.3*	ug/l	*50.0*		*107*	*40-140*		
Surrogate: 2-Bromonaphthalene			*52.7*	ug/l	*50.0*		*105*	*40-140*		

Notes and Definitions

Item	Definition
Wet	Sample results reported on a wet weight basis.
ND	Analyte NOT DETECTED at or above the reporting limit.

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CHAIN-OF-CUSTODY RECORD 36154

Turnaround

☐ 24-Hour* ☐ 72-Hour* ☐ Other _____ (days)
☐ 48-Hour* ☒ Standard (____ days) *Surcharge Applies

PROJECT NAME	PROJECT LOCATION	PROJECT NUMBER	LABORATORY
Shutesbury Library Ph II	Shutesbury, MA	20091032.A22	NETLAB

REPORT TO: Matt Kissane (mkissane@fando.com)

INVOICE TO: Matt Kissane

P.O. No.: 1701200910 32. A22

Sampler's Signature: Date: 1/11/23

Source Codes:
MW=Monitoring Well PW=Potable Water T=Treatment Facility S=Soil B=Sediment
SW=Surface Water ST=Stormwater W=Waste A=Air C=Concrete

X=Other X= Trip Blank

Analysis Request / Containers

Item No.	Transfer Check 1 2 3 4	Sample Number	Source Code	Date Sampled	Time Sampled	EPH	VPH	Total Metals (CAM 14 metals)	Soil VOA Vial, ☐ methanol	Soil VOA Vial, ☐ water	Glass Soil Container ( ) oz	Other:	Other:	Water VOA Vial, ☐ As is ☒ HCl	Glass Amber (1 L) ml, ☐ As is ☒ HCl	Plastic - As is, ☐ 250 ml ☐ 500 ☐ 1000 ml	Plastic - H_2SO_4, ☐ 250 ml ☐ 500 ml	Plastic - HNO_3, 250 ml ☒ Filtered ☐ 0.45µ ☒ 10µ	Plastic - NaOH, 250 ml	Comments
		1701230111 -01	MW	1/11/23	1100	X	X	X						2	1			1		
		-02			1155	X	X	X						2	1			1		
		-03			1250	X	X	X						2	1			1		
		-04			1340	X	X	X						2	1			1		
		-05			1440	X	X	X						2	1			1		
		-06	X		1500		X							2						

Transfer Number	Relinquished By	Accepted By	Date	Time
1		FED FRIDGE	1/11/23	1640
2			1/12	1045
3			1/12	1540
4				

Charge Exceptions: ☐ CT Tax Exempt ☐ QA/QC ☐ Other _____
____ Duplicates ____ Blanks (Item Nos:)

Reporting and Detection Limit Requirements: ☐ RCP Deliverables ☒ MCP CAM Cert. RCGW-1

CAM 14 Metals by 6010 / 7471, EPH & VPH by Mass DEP methodology

Additional Comments:

MassDEP Analytical Protocol Certification Form

Laboratory Name: New England Testing Laboratory, Inc. Project #: 20091032.A22

Project Location: Shutesbury, MA RTN:

This Form provides certifications for the following data set: list Laboratory Sample ID Number(s): 3A12040

Matrices: ☒ Groundwater/Surface Water ☐ Soil/Sediment ☐ Drinking Water ☐ Air ☐ Other:

CAM Protocol (check all that apply below):

8260 VOC CAM II A ☐	7470/7471 Hg CAM III B ☐	MassDEP VPH (GC/PID/FID) CAM IV A ☒	8082 PCB CAM V A ☐	9014 Total Cyanide/PAC CAM VI A ☐	6860 Perchlorate CAM VIII B ☐
8270 SVOC CAM II B ☐	7010 Metals CAM III C ☐	MassDEP VPH (GC/MS) CAM IV C ☐	8081 Pesticides CAM V B ☐	7196 Hex Cr CAM VI B ☐	MassDEP APH CAM IX A ☐
6010 Metals CAM III A ☒	6020 Metals CAM III D ☐	MassDEP EPH CAM IV B ☒	8151 Herbicides CAM V C ☐	8330 Explosives CAM VIII A ☐	TO-15 VOC CAM IX B ☐

Affirmative Responses to Questions A through F are required for "Presumptive Certainty" status

A	Were all samples received in a condition consistent with those described on the Chain-of-Custody, properly preserved (including temperature) in the field or laboratory, and prepared/analyzed within method holding times?	☒ Yes ☐ No
B	Were the analytical method(s) and all associated QC requirements specified in the selected CAM protocol(s) followed?	☒ Yes ☐ No
C	Were all required corrective actions and analytical response actions specified in the selected CAM protocol(s) implemented for all identified performance standard non-conformances?	☒ Yes ☐ No
D	Does the laboratory report comply with all the reporting requirements specified in CAM VII A, "Quality Assurance and Quality Control Guidelines for the Acquisition and Reporting of Analytical Data"?	☒ Yes ☐ No
E	VPH, EPH, APH, and TO-15 only a. VPH, EPH, and APH Methods only: Was each method conducted without significant modification(s)? (Refer to the individual method(s) for a list of significant modifications). b. APH and TO-15 Methods only: Was the complete analyte list reported for each method?	☒ Yes ☐ No ☐ Yes ☐ No
F	Were all applicable CAM protocol QC and performance standard non-conformances identified and evaluated in a laboratory narrative (including all "No" responses to Questions A through E)?	☒ Yes ☐ No

Responses to Questions G, H and I below are required for "Presumptive Certainty" status

G	Were the reporting limits at or below all CAM reporting limits specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

***Data User Note*: Data that achieve "Presumptive Certainty" status may not necessarily meet the data usability and representativeness requirements described in 310 CMR 40. 1056 (2)(k) and WSC-07-350.**

H	Were **all** QC performance standards specified in the CAM protocol(s) achieved?	☒ Yes ☐ No[1]
I	Were results reported for the complete analyte list specified in the selected CAM protocol(s)?	☒ Yes ☐ No[1]

[1]*All negative responses must be addressed in an attached laboratory narrative.*

I, the undersigned, attest under the pains and penalties of perjury that, based upon my personal inquiry of those responsible for obtaining the information, the material contained in this analytical report is, to the best of my knowledge and belief, is accurate and complete.

Signature: _____ **Position:** Laboratory Director

Printed Name: Richard Warila **Date**: 1/23/2023