DES Waste Management Division
29 Hazen Drive; PO Box 95
Concord, NH 03302-0095

November 2017 Water Quality Sampling Round
Rye Municipal Landfill
Breakfast Hill Road
Rye, NH 03870

NHDES Site #: 198705029
Project Type: LAND/UNLN
Project Number: 0000225

Prepared For:
Town of Rye
10 Central Road
Rye, NH 03870
Phone Number (603) 964-5523
RP Contact Name: Michael Magnant
RP Contact Email: MMagnant@town.rye.nh.us

Prepared By:
CMA Engineers, Inc.
35 Bow Street
Portsmouth, NH 03801
Phone Number: (603) 431-6196
Contact Name: Jodie Bray Strickland, P.E.
Contact Email: jstrickland@cmaengineers.com

Date of Report: January 3, 2018

Groundwater Monitoring Report Cover Sheet

Site Name: Rye Municipal Landfill, Breakfast Hill Road

Town: Rye

Permit #: GWP-198705029-R-005

Type of Submittal ***(*Check all that apply*)***

- ❑ Periodic Summary Report (*year*):
- ✓ Data Submittal (*month and year per Condition #7 of Permit*): November 2017

Check each box where the answer to any of the following questions is "YES"

Sampling Results

- ✓ During the most recent monitoring event, were any <u>new</u> compounds detected at any sampling point?

  Well/Compound: MW-1A/PFBA/PFPeA, MW-6A/PFBA/PFPeA

- ❑ Are there any detections of contamination in drinking water that is untreated prior to use?

  Well/Compound:

  - □ Do compounds detected exceed AGQS?

- ❑ Was free product detected for the <u>first time</u> in any monitoring point?
  - □ Surface Water (*visible sheen*)
  - □ Groundwater (*1/8" or greater thickness*)

    Location/Thickness:

Contaminant Trends

- ❑ Do sampling results show an increasing concentration trend in any source area monitoring well?

  Well/Compound:

- ❑ Do sampling results indicate an AGQS violation in any of the GMZ boundary wells?

  Well/Compound:

Recommendations

- ❑ Does the report include any recommendations requiring DES action? (*Do not check this box if the only recommendation is to continue with existing permit conditions.*)

This form is to be completed for groundwater monitoring data submittals and periodic summary reports submitted to the New Hampshire Department of Environmental Services Waste Management Division.

CMA ENGINEERS, INC.
CIVIL | ENVIRONMENTAL | STRUCTURAL

35 Bow Street
Portsmouth
New Hampshire
03801-3819

P: 603|431|6196
www.cmaengineers.com

January 3, 2018

Groundwater Permits Coordinator
New Hampshire Department of Environmental Services
Hazardous Waste Remediation Bureau,
Groundwater Remediation and Permitting
P.O. Box 95
29 Hazen Drive
Concord, New Hampshire 03302-0095

RE: Rye Municipal Landfill, Breakfast Hill Road
November 2017 Groundwater Results - GWP-198705029-R-005
CMA #527 D.12

Dear Permits Coordinator:

Please find enclosed the groundwater monitoring results from the November 2017 water quality sampling event at the Rye Municipal Landfill. The sampling was conducted in accordance with the July 11, 2013 Groundwater Management Permit for the landfill. The wells were sampled on November 20, 2017.

Inorganic indicators (including pH, specific conductance, chloride, nitrate, TKN), heavy metals iron and manganese and static water level were measured at MW-1A, MW-4A, MW-6A, MW-7B and MW-10. Manganese continues to exceed the AGQS of 0.84 mg/L at MW-4A (15 mg/L), MW-6A (3.6 mg/L), MW-7B (3.8 mg/L) and MW-10 (3.4 mg/L). Groundwater quality shows elevated readings of specific conductance and chloride concentrations at most locations. Results remain consistent with previous sampling events.

An additional round of perfluorinated compounds analyses was completed for this site. The results of the two PFAs with AGQS sampled on-site in November 2017 are summarized below:

Well Location	Perfluorooctanoic acid (PFOA) (ng/L)	Perfluorooctane sulfonic acid (PFOS) (ng/L)	PFOA + PFOS combined (ng/L)
MW-1A	7.02	6.00	13.02
MW-4A	19.6	26.8	46.4
MW-6A	66.1	6.86	72.96
MW-7B	17.1	Not detected	17.1
MW-10	13.6	4.66	18.26

We reiterate from prior correspondence that MW-4A and MW-6A are within the Groundwater Management Zone established for the site, and that the Town of Rye in recent years has adopted a zoning overlay of certain downgradient areas precluding the use of groundwater for drinking water purposes.

PFOA and PFOS were not detected at either of the two private water supply sampling locations within the zoning overlay when they were sampled in September.

If you have any questions regarding these results, please don't hesitate to contact us.

Very truly yours,

CMA ENGINEERS, INC.

Jodie Bray Strickland, P.E.
Project Engineer

Enclosures: Eastern Analytical Inc. Laboratory Report, November 20, 2017

cc: Michael Magnant, Town Administrator
Carolyn Beaulieu, Ciborowski Associates
OneStop Data

Eastern Analytical, Inc.
professional laboratory and drilling services

Paul Schmidt
CMA Engineers, Inc. (Portsmouth)
35 Bow Street
Portsmouth , NH 03801-3819

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 176218
Client Identification: Rye - Breakfast Hill LF
Date Received: 11/20/2017

Dear Mr. Schmidt :

Enclosed please find the laboratory report for the above identified project. All analyses were performed in accordance with our QA/QC Program. Unless otherwise stated, holding times, preservation techniques, container types, and sample conditions adhered to EPA Protocol. Samples which were collected by Eastern Analytical, Inc. (EAI) were collected in accordance with approved EPA procedures. Eastern Analytical, Inc. certifies that the enclosed test results meet all requirements of NELAP and other applicable state certifications. Please refer to our website at www.eailabs.com for a copy of our NELAP certificate and accredited parameters.

The following standard abbreviations and conventions apply to all EAI reports:
Solid samples are reported on a dry weight basis, unless otherwise noted
< : "less than" followed by the reporting limit
> : "greater than" followed by the reporting limit
%R : % Recovery

Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269) and Vermont (VT1012).

The following information is contained within this report: Sample Conditions summary, Analytical Results/Data, Quality Control data (if requested) and copies of the Chain of Custody. This report may not be reproduced except in full, without the the written approval of the laboratory.

If you have any questions regarding the results contained within, please feel free to directly contact me or the chemist(s) who performed the testing in question. Unless otherwise requested, we will dispose of the sample(s) 30 days from the sample receipt date.

We appreciate this opportunity to be of service and look forward to your continued patronage.

Sincerely,

Lorraine Olashaw, Lab Director | 12.13.17 Date | 24 # of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **176218**

Client: **CMA Engineers, Inc. (Portsmouth)**

Client Designation: **Rye - Breakfast Hill LF**

Temperature upon receipt (°C): 1.1 **Received on ice or cold packs (Yes/No): Y**

Acceptable temperature range (°C): 0-6

Lab ID	Sample ID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
176218.01	MW-1A	11/20/17	11/20/17	aqueous		Adheres to Sample Acceptance Policy
176218.02	MW-4A	11/20/17	11/20/17	aqueous		Adheres to Sample Acceptance Policy
176218.03	MW-6A	11/20/17	11/20/17	aqueous		Adheres to Sample Acceptance Policy
176218.04	MW-7B	11/20/17	11/20/17	aqueous		Adheres to Sample Acceptance Policy
176218.05	MW-10	11/20/17	11/20/17	aqueous		Adheres to Sample Acceptance Policy

Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitability, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.
Immediate analyses, pH, Total Residual Chlorine, Dissolved Oxygen and Sulfite, performed at the laboratory were run outside of the recommended 15 minute hold time.

All results contained in this report relate only to the above listed samples.

References include:

1) EPA 600/4-79-020, 1983
2) Standard Methods for Examination of Water and Wastewater,20th Edition, 1998 and 22nd Edition, 2012
3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
4) Hach Water Analysis Handbook, 2nd edition, 1992

LABORATORY REPORT

EAI ID#: **176218**

Client: **CMA Engineers, Inc. (Portsmouth)**

Client Designation: **Rye - Breakfast Hill LF**

Sample ID:	MW-1A	MW-4A	MW-6A	MW-7B					
Lab Sample ID:	176218.01	176218.02	176218.03	176218.04					
Matrix:	aqueous	aqueous	aqueous	aqueous					
Date Sampled:	11/20/17	11/20/17	11/20/17	11/20/17		Analysis			
Date Received:	11/20/17	11/20/17	11/20/17	11/20/17	**Units**	**Date**	**Time**	**Method**	**Analyst**
Chloride	**110**	**79**	**99**	**15**	mg/L	11/21/17	16:35	4500CIE-97	KD
Nitrate-N	**2.6**	**0.6**	**0.7**	< 0.5	mg/L	11/21/17	16:03	353.2	KD
TKN	< 0.5	**1.5**	**2.4**	**1.3**	mg/L	12/01/17	13:41	$4500N_{org}C/N$	SEL

Sample ID:	MW-10						
Lab Sample ID:	176218.05						
Matrix:	aqueous						
Date Sampled:	11/20/17	Analysis					
Date Received:	11/20/17	**Units**	**Date**	**Time**	**Method**	**Analyst**	
Chloride	**230**	mg/L	11/21/17	16:37	4500CIE-97	KD	
Nitrate-N	< 0.5	mg/L	11/21/17	16:23	353.2	KD	
TKN	**1.6**	mg/L	12/01/17	13:51	$4500N_{org}C/N$	SEL	

LABORATORY REPORT

EAI ID#: **176218**

Client: **CMA Engineers, Inc. (Portsmouth)**

Client Designation: **Rye - Breakfast Hill LF**

Sample ID:	MW-1A	MW-4A	MW-6A	MW-7B					
Lab Sample ID:	176218.01	176218.02	176218.03	176218.04					
Matrix:	aqueous	aqueous	aqueous	aqueous					
Date Sampled:	11/20/17	11/20/17	11/20/17	11/20/17	**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Date Received:	11/20/17	11/20/17	11/20/17	11/20/17					
Iron	< 0.05	**4.0**	**0.21**	**4.7**	AqDis	mg/L	11/21/17	200.8	DS
Manganese	**0.036**	**15**	**3.6**	**3.8**	AqDis	mg/L	11/21/17	200.8	DS

Sample ID:	MW-10								
Lab Sample ID:	176218.05								
Matrix:	aqueous								
Date Sampled:	11/20/17				**Analytical Matrix**	**Units**	**Date of Analysis**	**Method**	**Analyst**
Date Received:	11/20/17								
Iron	**3.4**				AqDis	mg/L	11/21/17	200.8	DS
Manganese	**3.4**				AqDis	mg/L	11/21/17	200.8	DS

LABORATORY REPORT

EAI ID#: **176218**

Client: **CMA Engineers, Inc. (Portsmouth)**

Client Designation: **Rye - Breakfast Hill LF**

Sample ID:	MW-1A	MW-4A	MW-6A	MW-7B				
Lab Sample ID:	176218.01	176218.02	176218.03	176218.04				
Matrix:	aqueous	aqueous	aqueous	aqueous				
Date Sampled:	11/20/17	11/20/17	11/20/17	11/20/17				
Date Received:	11/20/17	11/20/17	11/20/17	11/20/17	**Units**	**Date of Analysis**	**Method**	**Analyst**
Static Water Level	**17.91**	**19.21**	**38.45**	**45.08**	ft	11/20/17	Field	JG
Field pH	**6.2**	**6.0**	**6.2**	**6.2**	SU	11/20/17	SM4500H	JG
Field Conductivity	**840**	**480**	**1000**	**560**	uS/cm	11/20/17	SM2510B	JG

Sample ID:	MW-10				
Lab Sample ID:	176218.05				
Matrix:	aqueous				
Date Sampled:	11/20/17				
Date Received:	11/20/17	**Units**	**Date of Analysis**	**Method**	**Analyst**
Static Water Level	**28.40**	ft	11/20/17	Field	JG
Field pH	**6.1**	SU	11/20/17	SM4500H	JG
Field Conductivity	**1200**	uS/cm	11/20/17	SM2510B	JG

December 11, 2017

Vista Work Order No. 1701775

Ms. Jennifer Laramie
Eastern Analytical, Inc.
25 Chennell Drive
Concord, NH 03301

Dear Ms. Laramie,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on November 22, 2017. This sample set was analyzed on a rush turn-around time, under your Project Name '176218 NH 104'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Karen J. Vopenetta for

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph: 916-673-1520 fx: 916-673-0106 www.vista-analytical.com

Vista Work Order No. 1701775
Case Narrative

Sample Condition on Receipt:

Five aqueous samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

Modified EPA Method 537

The samples were extracted and analyzed for a selected list of PFAS using Modified EPA Method 537. The results for PFHxS, PFOA and PFOS include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above the Reporting Limit. The OPR recoveries were within the method acceptance criteria.

The recoveries of all internal standards in the QC and field samples were within the acceptance criteria.

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1701775-01	MW-1A	20-Nov-17 11:23	22-Nov-17 10:10	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1701775-02	MW-4A	20-Nov-17 10:13	22-Nov-17 10:10	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1701775-03	MW-6A	20-Nov-17 11:59	22-Nov-17 10:10	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1701775-04	MW-7B	20-Nov-17 12:19	22-Nov-17 10:10	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL
1701775-05	MW-10	20-Nov-17 09:30	22-Nov-17 10:10	HDPE Bottle, 125 mL
				HDPE Bottle, 125 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

Modified EPA Method 537

Client Data

Name: Eastern Analytical, Inc.
Project: 176218 NH 104
Matrix: Aqueous

Laboratory Data

Lab Sample: B7L0002-BLK1
Column: BEH C18

Analyte	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	ND	4.00		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
PFPeA	ND	4.00		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
PFBS	ND	4.00		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
PFHxA	ND	4.00		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
PFHpA	ND	4.00		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
PFHxS	ND	4.00		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
PFOA	ND	4.00		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
PFOS	ND	4.00		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
PFNA	ND	4.00		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	91.0	60 - 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
13C3-PFPeA	IS	87.5	60 - 150		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
13C3-PFBS	IS	99.3	60 - 150		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
13C2-PFHxA	IS	94.8	70 - 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
13C4-PFHpA	IS	88.8	60 - 150		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
18O2-PFHxS	IS	103	60 - 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
13C2-PFOA	IS	87.8	60 - 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
13C8-PFOS	IS	96.2	60 - 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1
13C5-PFNA	IS	83.1	50 - 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:47	1

RL - Reporting limit

LCL-UCL- Lower control limit - upper control limit
Results reported to RL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: OPR — **Modified EPA Method 537**

Client Data

Name: Eastern Analytical, Inc.
Project: 176218 NH 104
Matrix: Aqueous

Laboratory Data

Lab Sample: B7L0002-BS1
Column: BEH C18

Analyte	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	93.1	80.0	116	70-130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
PFPeA	95.4	80.0	119	70-130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
PFBS	85.2	80.0	107	70-130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
PFHxA	94.6	80.0	118	70-130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
PFHpA	81.9	80.0	102	70-130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
PFHxS	91.8	80.0	115	70-130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
PFOA	82.8	80.0	103	70-130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
PFOS	78.7	80.0	98.4	70-130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
PFNA	98.4	80.0	123	70-130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	95.1	60- 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
13C3-PFPeA	IS	89.8	60- 150		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
13C3-PFBS	IS	113	60- 150		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
13C2-PFHxA	IS	96.5	70- 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
13C4-PFHpA	IS	97.5	60- 150		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
18O2-PFHxS	IS	87.8	60- 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
13C2-PFOA	IS	78.1	60- 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
13C8-PFOS	IS	117	60- 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1
13C5-PFNA	IS	86.5	50- 130		B7L0002	04-Dec-17	0.125 L	08-Dec-17 13:24	1

Sample ID: MW-1A

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	Eastern Analytical, Inc.	Matrix:	Aqueous	Lab Sample:	1701775-01	Column:	BEH C18
Project:	176218 NH 104	Date Collected:	20-Nov-17 11:23	Date Received:	22-Nov-17 10:10		

Analyte	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	6.16	4.40		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
PFPeA	5.43	4.40		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
PFBS	ND	4.40		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
PFHxA	ND	4.40		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
PFHpA	ND	4.40		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
PFHxS	ND	4.40		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
PFOA	7.02	4.40		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
PFOS	6.00	4.40		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
PFNA	ND	4.40		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	99.7	60 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
13C3-PFPeA	IS	113	60 - 150		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
13C3-PFBS	IS	133	60 - 150		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
13C2-PFHxA	IS	108	70 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
13C4-PFHpA	IS	111	60 - 150		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
18O2-PFHxS	IS	103	60 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
13C2-PFOA	IS	82.4	60 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
13C8-PFOS	IS	102	60 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1
13C5-PFNA	IS	70.9	50 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:09	1

RL - Reporting limit

LCL-UCL- Lower control limit - upper control limit
Results reported to RL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Vista Analytical Laboratory

Sample ID: MW-4A

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	Eastern Analytical, Inc.	Matrix:	Aqueous	Lab Sample:	1701775-02	Column:	BEH C18
Project:	176218 NH 104	Date Collected:	20-Nov-17 10:13	Date Received:	22-Nov-17 10:10		

Analyte	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	ND	4.61		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
PFPeA	ND	4.61		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
PFBS	ND	4.61		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
PFHxA	ND	4.61		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
PFHpA	ND	4.61		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
PFHxS	ND	4.61		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
PFOA	19.6	4.61		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
PFOS	26.8	4.61		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
PFNA	ND	4.61		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	102	60 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
13C3-PFPeA	IS	99.1	60 - 150		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
13C3-PFBS	IS	129	60 - 150		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
13C2-PFHxA	IS	105	70 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
13C4-PFHpA	IS	103	60 - 150		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
18O2-PFHxS	IS	109	60 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
13C2-PFOA	IS	90.6	60 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
13C8-PFOS	IS	75.1	60 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1
13C5-PFNA	IS	80.6	50 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:20	1

RL - Reporting limit

LCL-UCL- Lower control limit - upper control limit
Results reported to RL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: MW-6A

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	Eastern Analytical, Inc.	Matrix:	Aqueous	Lab Sample:	1701775-03	Column:	BEH C18
Project:	176218 NH 104	Date Collected:	20-Nov-17 11:59	Date Received:	22-Nov-17 10:10		

Analyte	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	9.16	4.24		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
PFPeA	12.9	4.24		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
PFBS	ND	4.24		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
PFHxA	20.3	4.24		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
PFHpA	14.0	4.24		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
PFHxS	8.28	4.24		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
PFOA	66.1	4.24		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
PFOS	6.86	4.24		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
PFNA	ND	4.24		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	97.4	60 - 130		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
13C3-PFPeA	IS	97.3	60 - 150		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
13C3-PFBS	IS	122	60 - 150		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
13C2-PFHxA	IS	97.4	70 - 130		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
13C4-PFHpA	IS	101	60 - 150		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
18O2-PFHxS	IS	109	60 - 130		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
13C2-PFOA	IS	90.9	60 - 130		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
13C8-PFOS	IS	88.5	60 - 130		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1
13C5-PFNA	IS	88.3	50 - 130		B7L0002	04-Dec-17	0.118 L	08-Dec-17 14:31	1

RL - Reporting limit

LCL-UCL- Lower control limit - upper control limit
Results reported to RL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Sample ID: MW-7B

Modified EPA Method 537

Client Data				Laboratory Data			
Name:	Eastern Analytical, Inc.	Matrix:	Aqueous	Lab Sample:	1701775-04	Column:	BEH C18
Project:	176218 NH 104	Date Collected:	20-Nov-17 12:19	Date Received:	22-Nov-17 10:10		

Analyte	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	5.22	4.39		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
PFPeA	9.81	4.39		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
PFBS	ND	4.39		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
PFHxA	11.5	4.39		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
PFHpA	7.10	4.39		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
PFHxS	8.70	4.39		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
PFOA	17.1	4.39		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
PFOS	ND	4.39		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
PFNA	ND	4.39		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	98.1	60 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
13C3-PFPeA	IS	92.0	60 - 150		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
13C3-PFBS	IS	112	60 - 150		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
13C2-PFHxA	IS	95.8	70 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
13C4-PFHpA	IS	89.4	60 - 150		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
18O2-PFHxS	IS	105	60 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
13C2-PFOA	IS	90.4	60 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
13C8-PFOS	IS	94.7	60 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1
13C5-PFNA	IS	113	50 - 130		B7L0002	04-Dec-17	0.114 L	08-Dec-17 14:43	1

RL - Reporting limit

LCL-UCL- Lower control limit - upper control limit
Results reported to RL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

Vista Analytical Laboratory

Sample ID: MW-10

Modified EPA Method 537

Client Data

Name: Eastern Analytical, Inc.
Project: 176218 NH 104
Matrix: Aqueous
Date Collected: 20-Nov-17 09:30

Laboratory Data

Lab Sample: 1701775-05
Date Received: 22-Nov-17 10:10
Column: BEH C18

Analyte	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	ND	4.62		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
PFPeA	ND	4.62		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
PFBS	ND	4.62		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
PFHxA	ND	4.62		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
PFHpA	ND	4.62		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
PFHxS	ND	4.62		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
PFOA	13.6	4.62		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
PFOS	4.66	4.62		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
PFNA	ND	4.62		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	94.0	60 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
13C3-PFPeA	IS	97.1	60 - 150		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
13C3-PFBS	IS	115	60 - 150		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
13C2-PFHxA	IS	92.8	70 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
13C4-PFHpA	IS	100	60 - 150		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
18O2-PFHxS	IS	107	60 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
13C2-PFOA	IS	84.1	60 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
13C8-PFOS	IS	89.7	60 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1
13C5-PFNA	IS	93.0	50 - 130		B7L0002	04-Dec-17	0.108 L	08-Dec-17 14:54	1

RL - Reporting limit

LCL-UCL- Lower control limit - upper control limit
Results reported to RL.

When reported, PFHxS, PFOA and PFOS include both linear and branched isomers.
Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	**This compound was also detected in the method blank.**
D	**Dilution**
E	**The associated compound concentration exceeded the calibration range of the instrument.**
H	**Recovery and/or RPD was outside laboratory acceptance limits.**
I	**Chemical Interference**
J	**The amount detected is below the Reporting Limit/LOQ.**
M	**Estimated Maximum Possible Concentration. (CA Region 2 projects only)**
*	**See Cover Letter**
Conc.	**Concentration**
NA	**Not applicable**
ND	**Not Detected**
TEQ	**Toxic Equivalency**
U	**Not Detected (specific projects only)**

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

CERTIFICATIONS

Accrediting Authority	Certificate Number
Arkansas Department of Environmental Quality	17-015-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2016026
Minnesota Department of Health	1175673
New Hampshire Environmental Accreditation Program	207716
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-008
Pennsylvania Department of Environmental Protection	013
Texas Commission on Environmental Quality	T104704189-17-8
Virginia Department of General Services	8621
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B

Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

CHAIN-OF-CUSTODY RECORD

eastern analytical
professional laboratory services

1701775 0.0°C

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EAI ID# **176218** Page 1

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
MW-1A	11/20/2017 11:23	aqueous	Subcontract - Perfluorinated Compounds EPA Method 537 (9 Compounds)	
MW-4A	11/20/2017 10:13	aqueous	Subcontract - Perfluorinated Compounds EPA Method 537 (9 Compounds)	
MW-6A	11/20/2017 11:59	aqueous	Subcontract - Perfluorinated Compounds EPA Method 537 (9 Compounds)	
MW-7B	11/20/2017 12:19	aqueous	Subcontract - Perfluorinated Compounds EPA Method 537 (9 Compounds)	

EAI ID# 176218 **Project State: NH**

Project ID: 104

Company Vista Analytical Laboratory
Address 1104 Windfield Way
Address El Dorado Hills, CA 95762
Account #
Phone # (916) 673-1520
Fax Number

Results Needed by: Preferred date

QC Deliverables

☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ P

Notes about project:

Email pdf of results and invoice to customerservice@eailabs.com.

PO #: 47238 **EAI ID# 176218**

Please call prior to analyzing, if RUSH surcharges will be applied.

Samples Collected by:

Relinquished by	Date/Time	Received by
UPS	11/21/17 1700	
UPS	11/22/17 1034	

Relinquished by **Date/Time** **Received by**

Eastern Analytical, Inc. 25 Chenell Dr. Concord, NH 03301 Phone: (603)228-0525 1-800-287-0525 Fax: (603)228-4591

CHAIN-OF-CUSTODY RECORD

eastern analytical
professional laboratory services

1701775

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EAI ID# **176218**

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
MW-10	11/20/2017 9:30	aqueous	Subcontract - Perfluorinated Compounds EPA Method 537 (9 Compounds)	

EAI ID# 176218 **Project State: NH**

Project ID: 104

Company Vista Analytical Laboratory
Address 1104 Windfield Way
Address El Dorado Hills, CA 95762
Account #
Phone # (916) 673-1520
Fax Number

Results Needed by: Preferred date

QC Deliverables

☒ A ☐ A+ ☐ B ☐ B+ ☐ C ☐ P

Notes about project:

Email pdf of results and invoice to customerservice@eailabs.com.

PO #:47238 **EAI ID# 176218**

Please call prior to analyzing, if RUSH surcharges will be applied.

Samples Collected by:

Relinquished by	Date/Time	Received by
UPS	11/21/17 1600	UPS
UPS	11/22/17 1034	

Relinquished by **Date/Time** **Received by**

Vista Analytical Laboratory

Sample Log-in Checklist

WLS 11/24/17

Vista Work Order #: ~~1701755~~ 1701775 TAT 16 days

Samples Arrival:	**Date/Time** 11/22/17 1010		**Initials:**		**Location:** WR-2 **Shelf/Rack:** NA		
Logged In:	**Date/Time** 11/23/17 0813		**Initials:** WLS		**Location:** WR-2 **Shelf/Rack:** 2-4		
Delivered By:	FedEx	UPS	On Trac	GSO	DHL	Hand Delivered	Other
Preservation:	Ice		Blue Ice		Dry Ice		None
Temp °C: 0.0 (uncorrected) **Temp °C:** 0.0 (corrected)	**Time:** 1023 **Probe used:** Yes☑ No☐				**Thermometer ID:** DT-3		

		YES	NO	NA
Adequate Sample Volume Received?		✓		
Holding Time Acceptable?		✓		
Shipping Container(s) Intact?		✓		
Shipping Custody Seals Intact?				✓
Shipping Documentation Present?		✓		
Airbill	Trk # 1ZX465990198517414	✓		
Sample Container Intact?		✓		
Sample Custody Seals Intact?				✓
Chain of Custody / Sample Documentation Present?		✓		
COC Anomaly/Sample Acceptance Form completed?			✓	✓

If Chlorinated or Drinking Water Samples, Acceptable Preservation?						✓
Preservation Documented:	$Na_2S_2O_3$	Trizma	None	Yes	No	NA
Shipping Container	Vista	Client	Retain	Return	Dispose	

Comments:

CHAIN-OF-CUSTODY RECORD

eastern analytical
professional laboratory services

176218

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aSampleID	Date/Time	aMatrix	Parameters	Sample Notes	# of containers
MW-1 A	11/20/17 11:23	GW	Field Specific Conductance, Field pH, Chloride, Nitrate, TKN, Dissolved Iron, Manganese, SWL, PFAS 537		5
preservative: HCL (HNO3) (H2SO4) NaOH MEOH Na2S2O3 (ICE)					
MW-4 A	11/20/17 10:13	GW	Field Specific Conductance, Field pH, Chloride, Nitrate, TKN, Dissolved Iron, Manganese, SWL, PFAS 537		5
preservative: HCL (HNO3) (H2SO4) NaOH MEOH Na2S2O3 (ICE)					
MW-6 A	11/20/17 11:59	GW	Field Specific Conductance, Field pH, Chloride, Nitrate, TKN, Dissolved Iron, Manganese, SWL, PFAS 537		5
preservative: HCL (HNO3) (H2SO4) NaOH MEOH Na2S2O3 (ICE)					
MW-7B	11/20/17 12:19	GW	Field Specific Conductance, Field pH, Chloride, Nitrate, TKN, Dissolved Iron, Manganese, SWL, PFAS 537		5
preservative: HCL (HNO3) (H2SO4) NaOH MEOH Na2S2O3 (ICE)					
MW-10	11/20/17 09:30	GW	Field Specific Conductance, Field pH, Chloride, Nitrate, TKN, Dissolved Iron, Manganese, SWL, PFAS 537		5
preservative: HCL (HNO3) (H2SO4) NaOH MEOH Na2S2O3 (ICE)					

aClientID Rye - Breakfast Hill LF
nProjectID 104 **nYearMonth** 2017.11
Client (Pro Mgr) Paul Schmidt
Customer CMA Engineers, Inc. (Portsmouth)
Address 35 Bow Street
City Portsmouth **NH** 03801-3819
Phone 431-6196
Fax 431-5376

Results Needed by: Preferred date _____

Notes about project
Dissolved metals field filtered, preserved with nitric acid

Invoice town directly

PFC's by EPA 537 (9 compound list)

ReportingOptions
☐ HC ☐ NO FAX ☐ EDD Disk
☐ Fax ☐ No partial FAX ☒ EDD emai

PO# _____
Quote# 104244
Temperature 1-1 °C

Ice: Y☒ N☐

Samples Collected by: J.Coyne EA

Relinquished by	Date/Time	Received by
	11/20/17 1700	
Relinquished by	Date/Time	Received by