Northeast Utilities System

Public Service of New Hampshire
Northeast Utilities System
Merrimack Station
97 River Road
Bow, New Hampshire 03304

Phone (603) 224-4081
Fax (603) 634-2334

July 22, 2013

Mr. Mike Butler
Staff Engineer
Lowell Regional Wastewater Utility
451 First Street Boulevard (Route 110)
Lowell, Massachusetts 01850

Re: Quarter 2 Monthly Self-Monitoring Report
April through June 2013
Merrimack Station
Public Service Company of New Hampshire
Bow, New Hampshire

Dear Mr. Butler:

Public Service Company of New Hampshire (PSNH) is pleased to submit the attached **Self-Monitoring Report** (SMR) for the period April 1, 2013 through June 30, 2013. This SMR is intended to satisfy Condition 6 of Industrial Hauled Waste Permit (HWP) No. HW002 issued to PSNH by the Lowell Regional Wastewater Utility (LRWU). The discharged volume of Softened Stream B Wastewater was approximately 40,000 for the monitoring period. Softened Stream B Wastewater was the only approved waste stream discharged to LRWU during the second quarter of 2013. Wastewater flow was estimated based on the actual number of tanker trucks sent to LRWU during the second quarter of 2013 and tanker capacity.

The attached **SMR Summary Sheet** summarizes the analytical results contained in the attached **Analytical Data Reports** for all required parameters as outlined in Condition 6 of the HWP. The attached **Table 1** compares the results to the LRWU's Local Sewer Discharge Limits. The results indicate that pollutant concentrations were within the limits on the day of sampling. The attached **Table 2** summarizes wastewater shipments to LRWU in the second quarter of 2013. The analysis of the Softened Stream B sample collected on June 3, 2013, was performed in accordance with the United States Environmental Protection Agency (EPA) draft Standard Operating Procedure (SOP) for trace metals analysis of flue gas desulfurization (FGD) wastewater. The SOP is described below.

ANALYTICAL DISCUSSION

FGD wastewater requires specialized analytical techniques to overcome matrix interferences for analysis of certain trace metals. To assist you in evaluating this issue further, we offer an excerpt below from the EPA web site and a link to their draft SOP for trace metals analysis of FGD wastewater that contains further guidance.

LABORATORY ANALYSIS OF FGD WASTEWATER

Wastewater from FGD systems can contain constituents known to cause matrix interferences. EPA has observed that, during inductively coupled plasma–mass spectrometry (ICP-MS) analysis of FGD wastewater, certain elements commonly present in the wastewater may cause polyatomic interferences that bias the detection and/or quantization of certain elements of interest. These potential interferences may become significant when measuring trace elements at concentrations in the low parts-per-billion range.

As part of a recent sampling effort for the steam electric power generating effluent guidelines rulemaking, EPA developed a draft SOP that was used in conjunction with EPA Method 200.8 to conduct ICP-MS analyses of FGD wastewater. The draft SOP describes critical technical and quality assurance procedures that were implemented to mitigate anticipated interferences and generate reliable data for FGD wastewater. EPA regulations at 40 CFR 136.6 already allow the analytical community flexibility to modify approved methods to lower the costs of measurements, overcome matrix interferences, or otherwise improve the analysis. The draft SOP developed for FGD wastewater takes a proactive approach toward looking for and taking steps to mitigate matrix interferences, including using specialized interference check solutions (i.e., a synthetic FGD wastewater matrix). EPA's draft SOP is being made available to laboratories contemplating ICP-MS analysis of FGD wastewater, either for adoption as currently written or to serve as a framework for developing their own laboratory-specific SOPs. For further information, see:

- Standard Operating Procedure for Trace Element Analysis of Flue Gas Desulfurization Wastewaters using Inductively Coupled Plasma/Mass Spectrometry (ICP-MS) Collision/Reaction Cell Procedure. http://water.epa.gov/scitech/wastetech/guide/steam-electric/upload/ICPMS_FGD_Collision-Reaction-Cell-Procedure_draft_03-11-2013.pdf

Considering that specialized analytical techniques are necessary to overcome matrix interference for certain analysis of trace metals in FGD wastewater, we recommend any analysis on FGD wastewater be conducted in accordance with the EPA draft SOP for trace metals analysis of FGD wastewater.

Sincerely,

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

Brad Owens, Station Manager
p:\04jobs\0029300s\04.0029307.00\work\sampling and reporting\reports\lowell\monthly reports\2013\final lowell q2 ltr 071813.docx

Attachments

LOWELL REGIONAL WASTEWATER UTILITY
Industrial Sewer User Self-Monitoring Report Summary Sheet

Facility Information: Company Name Public Service Company of New Hampshire

Facility Address 97 River Road, Bow, New Hampshire Permit No. HW002

Facility Contact Brad Owens Telephone (603) 224-4081

----------***Use A Separate Summary Sheet For Each Monitoring Point***----------

Monitoring Report: Monitoring Point Top of filled truck Submittal Date 7/22/2013

Reporting Period (circle applicable): Baseline Annually Semi-Annually (Quarterly) Monthly Re-Sample

Reporting Period Start Date 4/01/2013 Reporting Period End Date 6/30/2013

Sample Analysis: Certified Analytical Lab Eastern Analytical, Inc. (EAI)

Authorized Rep. Lorraine Olashaw Certification No. 1012

Analytical Sub-Contractor Eurofins Frontier Global Sciences Certification No. E87575

Sample Collection: Sampler (Lab/Self/Other) Other: Paul Pepler, GZA GeoEnvironmental, Inc.

Sample Type(s) (circle all that apply):

(Grab) Time Composite Flow Composite

Grab Sampling: Sample Date 06/03/2013 (Softened Stream B WW) Sample Time 15:30

pH (Standard Units) 8.56 Instantaneous Flow Rate (GPM) N/A

Composite Sampling: Start Date/Time N/A Stop Date/Time N/A

No. Aliquots N/A Aliquot Volume N/A Sample Volume N/A

Flow Data: Sample Event Interval Volume (Gal) 8,000 Sample Event Daily Flow Rate (GPD) 16,000

Flow Monitoring Period Average Daily Flow (GPD) 440 [ ] Meter [X] Estimate

Flow Monitoring Period Start Date April 1, 2013 Flow Monitoring Period End Date June 30, 2013

Refer to Self-Monitoring Report Instructions for details on completing this SMR Summary Sheet

LOWELL REGIONAL WASTEWATER UTILITY
Industrial Sewer User Self-Monitoring Report Summary Sheet

Submit All Chains of Custody and Laboratory Result Sheets With SMR Summary Sheet

Analytical Results: N/A

Parameter	Analysis Date	Result (mg/L)	Parameter	Analysis Date	Result (mg/L)
BOD	06/05/2013	< 6	Copper		
COD	06/06/2013	610	Cyanide (Total)		
O & G 413.1 / 1664	06/10/2013	< 5	Fluoride		
TSS	06/06/2013	130	Lead		
TOC *			Mercury	06/12/2013	0.000157
TTO ** 624 / 8260B – 625 / 8270			Molybdenum		
Aluminum			Nickel		
Antimony			Nitrogen (Kjeldahl)	06/11/2013	4.1
Arsenic	07/13/2013	< 0.0075	Phenols (Total)		
Barium			Selenium		
Beryllium			Silver	07/13/2013	< 0.001
Cadmium			Thallium		
Chromium (Hexavalent)			Zinc		
Chromium (Total)			Other	See attached Table 1	

BOD = Biochemical Oxygen Demand COD = Chemical Oxygen Demand O & G = Oil & Grease TSS = Total Suspended Solids TTO = Total Toxic Organics
**TOC (Total Organic Carbon) = is the amount of carbon bound in an organic compound and is often used as a non-specific indicator of water quality. TOC measures both the total carbon present as well as the inorganic carbon (IC). Subtracting the inorganic carbon from the total carbon yields TOC.*
***TTO's = Summation of all quantifiable values greater than 0.01 mg/L for toxic organics listed in 40 CFR 413.02(i). TTO's include PCB's (Poly-Chlorinated Biphenyls), VOC's (Volatile Organic Compounds), SVOC's (Semi-Volatile Organic Compounds). PCB's, VOC's and SVOC's shall be analyzed using EPA Methods 608, 624, and 625, respectively.*

Zero Discharge / Self-Monitoring (initial if applicable):

_____ No industrial wastewater from permitted processes has been discharged to sewer during the monitoring period

_____ No sampling has been conducted on permitted sewer discharges during the monitoring period

Certification Statement:

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

Brad Owens
Printed Name of Authorized Representative

Signature of Authorized Representative

Station Manager
Title

7/22/2013
Date

TABLE 1
SUMMARY OF SOFTENED STREAM B CONCENTRATIONS
COMPARED TO LOWELL SEWER DISCHARGE LIMITS
QUARTER 2: APRIL - JUNE 2013

Public Service Company of New Hampshire
Merrimack Station
Bow, New Hampshire

PARAMETER	LOWELL SEWER DISCHARGE LIMITS (mg/L)	SOFTENED STREAM B RESULTS 06/03/2013 (mg/L)
Ammonia	-	2.1
Arsenic	0.556	0.0075
Chloride	-	33,000
COD	-	610
Mercury	0.004	0.000157
Nitrate	-	200
Nitrate+Nitrite	-	204.9
Nitrogen(T)	-	209.0
O&G (HEM)	250	<5
pH	5.0-9.5	8.56
Silver	0.053	<0.00100
Sodium	-	22,700
TSS	-	130
TKN	-	4.1
Total Phosphorous	-	0.30
CBOD	-	<6

ANALYTICAL DISCUSSION

FGD wastewater requires specialized analytical techniques to overcome matrix interferences for analysis of certain trace metals. To assist you in evaluating this issue further, we offer an excerpt below from the EPA web site and a link to their draft SOP for trace metals analysis of FGD wastewater that contains further guidance.

LABORATORY ANALYSIS OF FGD WASTEWATER

Wastewater from FGD systems can contain constituents known to cause matrix interferences. EPA has observed that, during inductively coupled plasma–mass spectrometry (ICP-MS) analysis of FGD wastewater, certain elements commonly present in the wastewater may cause polyatomic interferences that bias the detection and/or quantization of certain elements of interest. These potential interferences may become significant when measuring trace elements at concentrations in the low parts-per-billion range.

As part of a recent sampling effort for the steam electric power generating effluent guidelines rulemaking, EPA developed an SOP that was used in conjunction with EPA Method 200.8 to conduct ICP-MS analyses of FGD wastewater. The SOP describes critical technical and quality assurance procedures that were implemented to mitigate anticipated interferences and generate reliable data for FGD wastewater. EPA regulations at 40 CFR 136.6 already allow the analytical community flexibility to modify approved methods to lower the costs of measurements, overcome matrix interferences, or otherwise improve the analysis. The draft SOP developed for FGD wastewater takes a proactive approach toward looking for and taking steps to mitigate matrix interferences, including using specialized interference check solutions (i.e., a synthetic FGD wastewater matrix). EPA's draft SOP is being made available to laboratories contemplating ICP-MS analysis of FGD wastewater, either for adoption as currently written or to serve as a framework for developing their own laboratory-specific SOPs. For further information, see:

Standard Operating Procedure for Trace Element Analysis of Flue Gas Desulfurization Wastewaters using Inductively Coupled Plasma/Mass Spectrometry (ICP-MS) Collision/Reaction Cell Procedure. http://water.epa.gov/scitech/wastetech/guide/steam-electric/upload/ICPMS_FGD_Collision-Reaction-Cell-Procedure_draft_03-11-2013.pdf

Considering that specialized analytical techniques are necessary to overcome matrix interference for certain analysis of trace metals in FGD wastewater, we recommend any analysis on FGD wastewater be conducted in accordance with the EPA draft SOP for trace metals analysis of FGD wastewater. Accordingly, the analytical methods used to produce the metals data presented above, were performed in accordance with the draft EPA procedure for the analysis of FGD wastewater.

TABLE 2
SUMMARY OF WASTEWATER SHIPMENTS TO LOWELL REGIONAL WASTEWATER UTILITY
APRIL - JUNE 2013
Public Service Company of New Hampshire
Merrimack Station
Bow, New Hampshire

DATE	DAY	TICKET	TRUCKING COMPANY	pH	SOFTENED STREAM A VOLUME (gallons)	SOFTENED STREAM B VOLUME (gallons)	TOTAL DAILY VOLUME (gallons)
6/2/2013	Sunday	1443	O'Brien	8.44	-	8000	16,000
		1444	O'Brien	8.47	-	8000	
6/3/2013	Monday	1445	O'Brien	8.32	-	8000	16,000
		1446	O'Brien	8.54	-	8000	
6/4/2013	Tuesday	1447	O'Brien	8.23	-	8000	8,000

Shipments (Number of Trucks)	5
Truck Volume (Gallons)	8,000
Total Stream A Volume Discharged (Gallons)	-
Total Stream B Volume Discharged (Gallons)	40,000
Total Volume Discharged (Gallons)	40,000
Maximum Daily Flow (gallons per day)	16,000
Average Daily Flow (gallons per discharge day)	13,333
PERMITTED FLOW (GPD):	70,000

NOTE:
Wastewater was not shipped to the Lowell Regional Wastewater Utility during the months on April and May 2013.

Eastern Analytical, Inc.

Professional laboratory & drilling services

Paul Pepler
GZA GeoEnvironmental, Inc. (NH)
380 Harvey Road
Manchester , NH 03103

ACCREDITED IN ACCORDANCE WITH nelac

Subject: Laboratory Report

Eastern Analytical, Inc. ID: 121283
Client Identification: PSNH-MK | 3902
Date Received: 6/4/2013

Dear Mr. Pepler :

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

7.18.13
Date

26
# of pages (excluding cover letter)

SAMPLE CONDITIONS PAGE

EAI ID#: **121283**

Client: **GZA GeoEnvironmental, Inc. (NH)**

Client Designation: **PSNH-MK | 3902**

Temperature upon receipt (°C): 4.3 **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)
121283.01	Softened Stream B WW	6/4/13	6/3/13	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, Ignitibility, 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#: **121283**

Client: **GZA GeoEnvironmental, Inc. (NH)**

Client Designation: **PSNH-MK | 3902**

Sample ID:	Softened Stream BWW
Lab Sample ID:	121283.01
Matrix:	aqueous
Date Sampled:	6/3/13
Date Received:	6/4/13
Units:	mg/L
Date of Extraction/Prep:	6/10/13
Date of Analysis:	6/10/13
Analyst:	JCS
Method:	1664A
Dilution Factor:	1
Oil & Grease (HEM)	< 5

QC REPORT

EAI ID#: **121283**

Client: **GZA GeoEnvironmental, Inc. (NH)**

Client Designation: **PSNH-MK | 3902**

Parameter Name	Blank	LCS	LCSD	Analysis Date	Units	Limits	RPD	Method
Oil & Grease (HEM)	< 5	36 (91 %R)	36 (91 %R) (0 RPD)	6/10/2013	mg/L	78 - 114	18	1664A

Samples were extracted and analyzed within holding time limits.
Instrumentation was calibrated in accordance with the method requirements.
The method blanks were free of contamination at the reporting limits.
Sample surrogate recoveries met the above stated criteria.
The associated matrix spikes and/or Laboratory Control Samples met acceptance criteria.
There were no exceptions in the analyses, unless noted.
*/! Flagged analyte recoveries deviated from the QA/QC limits. Any impact to data is addressed below .

LABORATORY REPORT

EAI ID#: **121283**

Client: **GZA GeoEnvironmental, Inc. (NH)**

Client Designation: **PSNH-MK | 3902**

Sample ID:	Softened Stream B WW
Lab Sample ID:	121283.01
Matrix:	aqueous
Date Sampled:	6/3/13
Date Received:	6/4/13

		Analysis			
	Units	**Date**	**Time**	**Method**	**Analyst**
Solids Total	mg/L	6/06/13	10:20	2540B	SCW
Solids Suspended	mg/L	6/06/13	10:35	2540D	SCW
Chloride	mg/L	6/08/13	15:27	4500ClE	KD
Nitrite-N	mg/L	6/05/13	9:11	353.2	KD
Nitrate-N	mg/L	6/05/13	10:13	353.2	KD
Ammonia-N	mg/L	6/10/13	15:30	4500NH3D	SEL
TKN	mg/L	6/11/13	15:46	4500N_{org}C/	SEL
CBOD	mg/L	6/05/13	7:42	5210B	SCW
COD	mg/L	6/06/13	9:35	H8000	SCW
Total Nitrogen	mg/L	6/26/13	13:00	4500N_{nm}C/	KL
Total Phosphorus-P	mg/L	7/01/13	12:58	365.1	SEL

Solids Total	**73000**
Solids Suspended	**130**
Chloride	**33000**
Nitrite-N	**4.9**
Nitrate-N	**200**
Ammonia-N	**2.1**
TKN	**4.1**
CBOD	< 6
COD	**610**
Total Nitrogen	**209**
Total Phosphorus-P	**0.30**

The Solids Total is equal to 7.3%

Total Nitrogen is determined by the addition of Nitrate-N, Nitrite-N and TKN (TKN = Ammonia plus TON) concentrations.

QC REPORT

EAI ID#: **121283**

Client: **GZA GeoEnvironmental, Inc. (NH)**

Client Designation: **PSNH-MK | 3902**

Parameter Name	Blank	LCS	LCSD	Units	Date of Analysis	Limits	RPD	Method
Solids Total	< 10	1100 (98 %R)	NA	mg/L	6/6/13	85 - 115		2540B
Solids Suspended	< 5	100 (101 %R)	99 (99 %R) (2 RPD)	mg/L	6/6/13	90 - 110	20	2540D
Chloride	< 1	24 (96 %R)	24 (97 %R) (1 RPD)	mg/L	6/8/13	90 - 110	20	4500CIE
Nitrite-N	< 0.5	5.0 (101 %R)	5.1 (101 %R) (0 RPD)	mg/L	6/5/13	90 - 110	20	353.2
Nitrate-N	< 0.5	5.1 (102 %R)	5.0 (100 %R) (2 RPD)	mg/L	6/5/13	90 - 110	20	353.2
Ammonia-N	< 0.05	2.1 (104 %R)	1.9 (97 %R) (7 RPD)	mg/L	6/10/13	90 - 110	20	4500NH3DN
TKN	< 0.5	5.0 (101 %R)	5.0 (101 %R) (0 RPD)	mg/L	6/11/13	90 - 110	20	$4500N_{org}C/N$
Total Phosphorus-P	< 0.01	0.29 (95 %R)	0.29 (95 %R) (0 RPD)	mg/L	7/1/13	90 - 110	20	365.1
CBOD	< 6	410 (104 %R)	410 (102 %R) (2 RPD)	mg/L	6/5/13	60 - 120	20	5210B
COD	< 10	95 (95 %R)	94 (94 %R) (1 RPD)	mg/L	6/6/13	85 - 115	20	H8000

Samples were analyzed within holding times unless noted on the sample results page.
Instrumentation was calibrated in accordance with the method requirements.
The method blanks were free of contamination at the reporting limits.
The associated matrix spikes and/or Laboratory Control Samples met the above stated criteria.
Exceptions to the above statements are flagged or noted above or on the QC Narrative page.
*/! Flagged analyte recoveries deviated from the QA/QC limits.

eurofins | Frontier Global Sciences

11720 North Creek Parkway North, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
www.frontiergs.com

17 July 2013

Jeff Gagne
Eastern Analytical, Inc
25 Chenell Drive
Concord, NH 03301

RE: Merrimack Station 200.8

Enclosed are the analytical results for samples received by Eurofins Frontier Global Sciences. All quality control measurements are within established control limits and there were no analytical difficulties encountered with the exception of those listed in the case narrative section of this report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Liz Siska

Liz Siska
Project Manager

eurofins | Frontier Global Sciences

11720 North Creek Parkway North, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
www.frontiergs.com

ANALYTICAL REPORT FOR SAMPLES

Laboratory: Eurofins Frontier Global Sciences, Inc.
SDG:
Client: Eastern Analytical, Inc
Project: Merrimack Station 200.8

Sample ID	Lab ID	Matrix	Date Sampled	Date Received
Softened Stream B WW	1306110-01	Water	03-Jun-13 15:30	05-Jun-13 09:20
Field Blank	1306110-02	Water	03-Jun-13 03:10	05-Jun-13 09:20

Eurofins Frontier Global Sciences

Liz Siska

Liz Siska, Project Manager

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

eurofins | Frontier Global Sciences

11720 North Creek Parkway North, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
www.frontiergs.com

CASE NARRATIVE

REVISED REPORT 7/17/13- Client requested a lower dilution for Ag and As.

SAMPLE RECEIPT
One (1) water sample and one (1) field blank was received on June 5th, 2013 at Eurofins Frontier Global Sciences (EFGS). The sample was received intact, on-ice within a cooler at 2.4 degrees Celsius.

SAMPLE PREPARATION AND ANALYSIS
Sample preparation and analysis for trace metals was performed in accordance with EPA Method 200.8 with the use of a collison cell.

Sample preparation and analysis for mercury was performed in accordance with EPA Method 1631E.

ANALYTICAL ISSUES
Liquid spikes were prepared for every preparation as a measure of accuracy. All liquid spikes and certified reference material (if applicable) were within the control limits.

As an additional measure of the accuracy of the methods used and to check for matrix interference, matrix spikes (MS) and matrix spike duplicates (MSD) were digested and analyzed. All of the matrix spike recoveries were within the control limits.

A reasonable measure of the precision of the analytical methods is the relative percent difference (RPD) between a matrix spike recovery and a matrix spike duplicate recovery and between laboratory control sample recovery and laboratory control sample duplicate recoveries. All of the relative percent differences were within the control limits.

Eurofins Frontier Global Sciences

Liz Siska

Liz Siska, Project Manager

eurofins | Frontier Global Sciences

11720 North Creek Parkway North, Suite 400
Bothell, WA 98011
Phone: 425-686-1996
www.frontiergs.com

CHAIN OF CUSTODY FORMS

EFGS Work Order: 1306110

Sample Receipt Checklist

Eurofins Frontier Global Sciences

Client: eastern analytical Date & Time Received: 6-5-13 9:20 Date Logged In: 6-6-13 Date Labeled: 6-6-13

Project: PO 40313 Received By: OB Logged By: OB Labeled By: AJ

# of Coolers Received: 1 Samples Arrived By: ✓ Shipping Service ____ Courier ____ Hand ____ Other (Specify:____)

Tracking/Airbill #: 12 XA6 599 01 9206 6234 Coolant: ☐ None/Ambient ☒ Loose Ice ☐ Gel Ice ☐ Dry Ice

Coolant Required: Y (N) Temp Blank Used (Y) N for Cooler(s): 1

Cooler Information:	Y/N/NA	Comments
The coolers do not appear to be tampered with:	Y	
Custody Seals are present and intact:	N/A	
Custody seals signed by:	N/A	

TID: 5275 CF: -0.3 °C Date/time: 6-5-13 930 By: OB/AMB

Cooler 1:	2.7 °C	w/ CF:	2.4 °C	Cooler 4:	°C	w/ CF:	°C
Cooler 2:	°C	w/ CF:	°C	Cooler 5:	°C	w/ CF:	°C
Cooler 3:	°C	w/ CF:	°C	Cooler 6:	°C	w/ CF:	°C

Chain of Custody:	Y/N/NA	Comments
Sample ID/Description:	Y	
Date and time of collection:	Y	
Sampled by:	Y	
Preservation type:	N/A	
Requested analyses:	Y	
Required signatures:	Y	
Internal COC required:	N	

Sample Condition/Integrity:	Y/N/NA	Comments
Sample containers intact/present:	Y	
Sample labels are present and legible:	Y	
Sample ID on container/bag matches COC:	Y N	*SEE BELOW
Correct sample containers used:	Y	
Samples received within holding times:	Y	
Sample volume sufficient for requested analyses:	Y	
Correct preservative used for requested analyses:	N/A	
pH of preserved samples verified and recorded:	N/A	

Anomalies/Non-conformances (attach additional pages if needed):
*The field blank sample was not listed on the COC. Per AM, sample was logged for Hg only. AMB 6/10/13

Field blank 6/7/13 AMB 6/10/13 AMB

Discussion/Resolution: Client Contacted:____ Date/Time:____ Method:____

EFGS Sample Receipt Checklist Revision 3; 03/15/2013

Eurofins Frontier Global Sciences

Liz Siska

Liz Siska, Project Manager

The results in this report only apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

eurofins | Frontier Global Sciences

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Bothell, WA 98011
Phone: 425-686-1996
www.frontiergs.com

CHAIN OF CUSTODY FORMS

CHAIN-OF-CUSTODY RECORD

eastern analytical
professional laboratory services

1306110

EAI SRB# 121283

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
Softened Stream B WW	6/3/2013 15:30	aqueous	Surface Water Low Level Metals – See list below.	

EAI SRB# 121283 Project State: NH
Project ID: 3902

Company Frontier Global Sciences, Inc.
Address 11720 North Creek Pkwy
Address Bothell, WA,98011 USA
Account #
Phone # 1.425.686.1996
Fax Number 1.425.686.3096

Results Needed by: Preferred date Std
QC Deliverables
☐A ☐A+ ☒B ☐B+ ☐C ☐P-
Notes about project:
Email pdf of results and invoice to customerservice@eailabs.com.
Test for metals via Method 200.8 MOD (ICP-MS with Collision cell)
Metals: As,Ag, Na,Hg

Eastern Analytical Inc. PO Number: 40313
Please call prior to analyzing, if RUSH surcharges will be applied.

Samples Collected by:
Relinquished by 6/4/2013 1530 UPS
Date/Time Received by
Relinquished by Date/Time Received by EFGS 6/5/13 0920

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

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Temp: 2.4°C w/out seal UPS: 1Z XA6 599 01 9206 [illegible]

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Liz Siska

Liz Siska, Project Manager

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ANALYTICAL RESULTS

Softened Stream B WW

Matrix: Water **Laboratory ID:** 1306110-01

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Arsenic	ND	-	7.50	µg/L	50	F306206	3G16008	07/13/13	EPA 200.8	R-05, U
Mercury	157	-	10.1	ng/L	20	F306168	3F12010	06/12/13	EPA 1631E	
Silver	ND	-	1.00	µg/L	50	F306206	3G16008	07/13/13	EPA 200.8	R-05, U
Sodium	22700000	-	1250000	µg/L	50000	F306206	3F26016	06/26/13	EPA 200.8	R-05

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ANALYTICAL RESULTS

Field Blank

Matrix: Water

Laboratory ID: 1306110-02

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Mercury	ND	-	0.50	ng/L	1	F306168	3F12010	06/12/13	EPA 1631E	U

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MATRIX DUPLICATES/TRIPLICATES

SOURCE: 1305605-03

Batch: F306168 **Sequence:** 3F12010

Preparation: EPA 1631E BrCl Oxidation **Lab Number:** F306168-DUP1

Analyte	Sample Concentration ng/L	Duplicate Concentration ng/L	MRL	% RPD	RPD Limit	Method	Notes
Mercury	6.63	6.61	0.50	0.279	24	EPA 1631E	

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1305605-05

Batch: F306168 **Sequence:** 3F12010

Preparation: EPA 1631E BrCl Oxidation **Lab Number:** F306168-MS/MSD1

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Recovery Limits	Method	Notes
Mercury	7.91	20.400	25.56	86.5	71 - 125	EPA 1631E	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	20.400	25.36	85.5	0.791	71 - 125	24	EPA 1631E	

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1305658-01

Batch: F306168 **Sequence:** 3F12010

Preparation: EPA 1631E BrCl Oxidation **Lab Number:** F306168-MS/MSD2

Analyte	Sample Concentration (ng/L)	Spike Added (ng/L)	MS Concentration (ng/L)	MS % Recovery	Recovery Limits	Method	Notes
Mercury	5.43	20.400	24.42	93.1	71 - 125	EPA 1631E	

Analyte	Spike Added (ng/L)	MSD Concentration (ng/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	20.400	24.96	95.8	2.23	71 - 125	24	EPA 1631E	

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1306092-01RE1

Batch: F306206 **Sequence:** 3F26016

Preparation: EFGS-052 Closed Vessel Nitric Oven Digestion **Lab Number:** F306206-MS/MSD5

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Sodium	22080000	5578.4	22140000	1120	70 - 130	EPA 200.8	QM-02, R-05
Arsenic	ND	15.225	ND		70 - 130	EPA 200.8	QB-02, QM-02, R-05, U
Silver	473.0	1.5225	225.8	-16200	70 - 130	EPA 200.8	QM-02, R-05

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	5578.4	22090000	75.5	0.263	70 - 130	20	EPA 200.8	QM-02, R-05
Arsenic	15.225	ND			70 - 130	20	EPA 200.8	QB-02, QM-02, R-05, U
Silver	1.5225	ND	-31100		70 - 130	20	EPA 200.8	QM-02, R-05, U

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1306110-01RE1

Batch: F306206 **Sequence:** 3F26016

Preparation: EFGS-052 Closed Vessel Nitric Oven Digestion **Lab Number:** F306206-MS/MSD6

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Sodium	22710000	5578.4	21660000	-18900	70 - 130	EPA 200.8	QB-01, QM-02, R-05
Arsenic	ND	15.225	ND		70 - 130	EPA 200.8	R-05, QB-02, QM-02, U
Silver	529.3	1.5225	280.1	-16400	70 - 130	EPA 200.8	QM-02, R-05

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	5578.4	21740000	-17500	0.374	70 - 130	20	EPA 200.8	QB-01, QM-02, R-05
Arsenic	15.225	ND			70 - 130	20	EPA 200.8	QB-02, QM-02, R-05, U
Silver	1.5225	222.3	-20200	23.0	70 - 130	20	EPA 200.8	QM-02, R-05

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1306092-01RE1

Batch: F306206 **Sequence:** 3F26016

Preparation: EFGS-052 Closed Vessel Nitric Oven Digestion **Lab Number:** F306206-MS/MSD7

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Sodium	22080000	101500000	112500000	89.1	70 - 130	EPA 200.8	AS, R-05
Arsenic	ND	1015000	954000	94.0	70 - 130	EPA 200.8	AS, QB-01, R-05
Silver	473.0	50750	48140	93.9	70 - 130	EPA 200.8	AS, R-05

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	101500000	115800000	92.4	2.94	70 - 130	20	EPA 200.8	AS, R-05
Arsenic	1015000	947000	93.3	0.739	70 - 130	20	EPA 200.8	AS, QB-01, R-05
Silver	50750	49460	96.5	2.70	70 - 130	20	EPA 200.8	AS, R-05

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1306110-01RE1

Batch: F306206 **Sequence:** 3F26016

Preparation: EFGS-052 Closed Vessel Nitric Oven Digestion **Lab Number:** F306206-MS/MSD8

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Sodium	22710000	101500000	113500000	89.5	70 - 130	EPA 200.8	AS, QB-01, R-05
Arsenic	ND	1015000	949500	93.5	70 - 130	EPA 200.8	AS, QB-01, R-05
Silver	529.3	50750	49770	97.0	70 - 130	EPA 200.8	AS, R-05

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	101500000	115200000	91.1	1.43	70 - 130	20	EPA 200.8	AS, QB-01, R-05
Arsenic	1015000	957600	94.3	0.847	70 - 130	20	EPA 200.8	AS, QB-01, R-05
Silver	50750	50200	97.9	0.859	70 - 130	20	EPA 200.8	AS, R-05

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LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Batch: F306168
Preparation: EPA 1631E BrCl Oxidation
Sequence: 3F12010
Lab Number: F306168-BS/BSD1
LCS Source: NIST 1641d

Analyte	Spike Added (ng/L)	LCS Concentration (ng/L)	LCS % Recovery	Recovery Limits	Method	Notes
Mercury	15.679	15.12	96.5	77 - 123	EPA 1631E	

Analyte	Spike Added (ng/L)	LCSD Concentration (ng/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Mercury	15.679	14.97	95.5	0.988	77 - 123	24	EPA 1631E	

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LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Batch: F306206 **Sequence:** 3F26016

Preparation: EFGS-052 Closed Vessel Nitric Oven Digestion **Lab Number:** F306206-BS/BSD1

LCS Source: Blank Spike

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Arsenic	15.000	15.54	104	85 - 115	EPA 200.8	QB-01
Silver	1.5000	1.466	97.7	85 - 115	EPA 200.8	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Arsenic	15.000	14.79	98.6	4.91	85 - 115	20	EPA 200.8	QB-01
Silver	1.5000	1.502	100	2.41	85 - 115	20	EPA 200.8	

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LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Batch: F306206
Sequence: 3F26016
Preparation: EFGS-052 Closed Vessel Nitric Oven Digestion
Lab Number: F306206-BS/BSD2
LCS Source: Blk Spk 1

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Sodium	5496.0	6123	111	85 - 115	EPA 200.8	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	5496.0	6249	114	2.03	85 - 115	20	EPA 200.8	

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PREPARATION BLANKS

Instrument: Hg2600-2

Sequence: 3F12010

Preparation: EPA 1631E BrCl Oxidation

Lab Sample ID	Analyte	Found	MDL	MRL	Units	Batch	Method	Notes
F306168-BLK1	Mercury	0.04	0.08	0.50	ng/L	F306168	EPA 1631E	U
F306168-BLK2	Mercury	-0.02	0.08	0.50	ng/L	F306168	EPA 1631E	U
F306168-BLK3	Mercury	-0.03	0.08	0.50	ng/L	F306168	EPA 1631E	U
F306168-BLK4	Mercury	0.07	0.08	0.50	ng/L	F306168	EPA 1631E	QB-04, U

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PREPARATION BLANKS

Instrument: ICPMS-6

Sequence: 3F26016

Preparation: EFGS-052 Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MDL	MRL	Units	Batch	Method	Notes
F306206-BLK3	Sodium	5	4	25	µg/L	F306206	EPA 200.8	U
F306206-BLK4	Sodium	4	4	25	µg/L	F306206	EPA 200.8	U
F306206-BLK1	Arsenic	0.17	0.10	0.15	µg/L	F306206	EPA 200.8	QB-10
F306206-BLK2	Arsenic	0.09	0.10	0.15	µg/L	F306206	EPA 200.8	QB-02, U
F306206-BLK1	Silver	0.014	0.002	0.020	µg/L	F306206	EPA 200.8	U
F306206-BLK2	Silver	0.008	0.002	0.020	µg/L	F306206	EPA 200.8	U

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Notes and Definitions

U	Analyte was not detected and is reported as less than the LOD or as defined by the client. The LOD has been adjusted for any dilution or concentration of the sample.
R-05	The sample was diluted due to the presence of high levels of non-target analytes or particulates resulting in elevated reporting limits.
QM-02	The MS and/or MSD recoveries outside acceptance limits, due to spike concentration less than 1 times the sample concentration. The batch was accepted based on LCS and LCSD recoveries within control limits and, when analysis permits, acceptable AS/ASD.
QB-10	The method blank and/or initial/continuing calibration blank contains analyte at a concentration above the MRL. Only report sample results greater than 10 times the contamination value (QB-01), or samples less than the MRL (QB-02).
QB-04	The blank was preserved to 2% BrCl rather than 1%. The control limit for blanks preserved to greater than 1% BrCl is the preservation percentage multiplied by the MRL.
QB-02	The method blank and/or initial/continuing calibration blank contains analyte at a concentration above the MRL. However, the sample concentrations are less than the MRL.
QB-01	The method blank and/or initial/continuing calibration blank contains analyte at a concentration above the MRL. However, the blank concentration(s) are less than 10% of the sample result.
AS	This MS and/or MSD is an analytical spike and/or an analytical spike duplicate.
DET	Analyte Detected
MDL	Minimum Detection Limit
MRL	Minimum Reporting Limit
ND	Analyte Not Detected at or above the reporting limit
wet	Sample results reported on a wet weight basis
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
RSD	Relative Standard Deviation

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Liz Siska, Project Manager

Page 1 of 1

Chain-of-Custody Record

Bold Fields Required. Please Circle Requested Analysis.

121283

Sample I.D.	Sampling Date/Time *If Composite, Indicate Both Start & Finish Date/Time	Matrix (see below)	Grab/*Composite	VOC: 524.2 524.2 BTEX	524.2 MTBE only	624 VTICs	624 Oxygenate EDB DBCP	8021B BTEX HALOS	8015B GRO MEGRO MAPH	SVOC: 8270D 625 SVTICs ABN A BN PAH	TPH 8100 LI L2	8015B DRO MEDRO MAEPH	PEST 608 PCB 608 PEST 8081A PCB 8082	Oil & Grease 1664 TPH 1664	TCLP: TCLP 1311 ABN Metals VOC Pest Herb	Dissolved Metals (List Below)	Total Metals (List Below)	Inorganics: TS TDS TSS Spec Con	Br Cl F SO4 NO2 NO2,NO3	BOD CBOD T. Alk.	TKN NH3 T. Phos. O. Phos.	pH T. Res. Chlorine	COD Phenols TOC DOC	Total Cyanide Total Sulfide	Reactive Cyanide Reactive Sulfide Flashpoint Ignitability	Micro: Total Coliform E. Coli Fecal Coliform	Enterococci Heterotrophic Plate Count	Other	# of Containers	Notes MeOH Vial #
Softened Stream B WW	6/3/13 330	WW	G											X			X	X	X	X	X	X		X						9	
Matrix: A-Air; S-Soil; GW-Ground Water; SW-Surface Water; DW-Drinking Water; WW-Waste Water														S							S		S							
Preservative: H-HCL; N-HNO_3; S-H_2SO_4; Na-NaOH; M-MEOH																														

Project Manager: Paul Pepler

Company: GZA GeoEnvironmental, Inc.

Address: 380 Harvey Road

City: Manchester State: NH Zip: 03103

Phone: 603-232-8717 Ext.:

Fax:

E-Mail: paul.pepler@gza.com

Site Name: PSNH- MK

Project #: 3902

State: (NH) MA ME VT Other:

Regulatory Program: NPDES; RGP POTW Stormwater or GWP, Oil Fund, Brownfield or Other:

Quote #: PO #:

Date Needed: Standard TAT

QA/QC Reporting Level: A B C OR Presumptive Certainty

Reporting Options: Prelims: (YES) or No; If Yes: Fax or PDF

Electronic Options: No Fax E-Mail (PDF) Equis

Temp. 4.3 °C

Ice? (Yes) No

Sampler(s): Paul Pepler

Relinquished By: Date: 6/4/13 Time: 0930 Received By: RAB

Relinquished By: RAB 2013.06.04 Date: Time: 1325 Received By:

Relinquished By: Date: Time: Received By:

Metals: 8 RCRA 13 PP Fe, Mn Pb, Cu

Other Metals:

Dissolved Metals Field Filtered? Yes No

Notes: (ie: Special Detection Limits, Billing Info, If Different)

As, Ag, Hg, Na

FIELD pH: 8.56

Please send metals to Frontier for analysis by Method 200.8 MOD (ICP-MS with Collision cell)

Site History:

Suspected Contamination:

Field Readings:

eastern analytical, inc.
professional laboratory services
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(White: Original Green: Project Manager)