



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

March 29, 2013

Mr. Bruce Kudrick
Superintendent, Hooksett Sewer Commission
Town of Hooksett
1 Egawes Drive
Hooksett, New Hampshire 03106

Re: February Wastewater Discharge Monitoring Report
Treated Wastewater
Merrimack Station
Public Service Company of New Hampshire
Bow, New Hampshire

Dear Mr. Kudrick:

Public Service Company of New Hampshire is pleased to submit the attached **Wastewater Discharge Monitoring Report** (DMR) for the period February 1, 2013 through February 28, 2013, in accordance with Waste Disposal Agreement WDA-001. Wastewater (Softened Stream A) flow was approximately 186,000 gallons for the monitoring period and was estimated based on the actual number of tanker trucks discharged to the Hooksett Sanitary Sewer System (Hooksett) from February 1, 2013 through February 28, 2013 and metered tanker capacity. Softened Stream A was the only approved waste stream discharged to Hooksett in February 2013.

Table 1 included in the Wastewater DMR summarizes the analytical results contained in the attached **Analytical Data Report**. **Table 2** included in the Wastewater DMR summarizes wastewater shipments to Hooksett in the month of February 2013. The analysis of the Softened Stream A sample collected on February 16, 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 interference for certain analysis of 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.

CONFIDENTIAL BUSINESS INFORMATION



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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 SOP. For further information please see EPA link below:

- Standard Operating Procedure: Inductively Coupled Plasma/Mass Spectrometry for Trace Element Analysis in Flue Gas Desulfurization Wastewaters (30 pp, 174K), http://water.epa.gov/scitech/wastetech/guide/steam-electric/upload/Steam-Electric_FGD_Draft-SOP_2011.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.

Should you have any questions, please contact Ron Breton with GZA at 232-8744 or me at 224-4081.

Sincerely,

PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE

Brad Owens, Station Manager

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Attachments

CONFIDENTIAL BUSINESS INFORMATION

CONFIDENTIAL BUSINESS INFORMATION

**WASTEWATER DISCHARGE MONITORING REPORT
HOOKSETT WASTEWATER TREATMENT PLANT**

Public Service Company of New Hampshire - Merrimack Station
Waste Disposal Agreement No. WDA-001
Issued October 1, 2012
Expires September 30, 2013

FACILITY INFORMATION

Company Name: Public Service Company of New Hampshire - Merrimack Station
Company Owner: Public Service Company of New Hampshire
Facility Address: 97 River Road
Facility Contact: Brad Owens
Telephone: (603) 224-4081

MONITORING REPORT

Submittal Date: 3/29/2013
Monitoring Point: Truck loading station
Reporting Period: February 2013

SAMPLE ANALYSIS

Certified Analytical Laboratory: Eastern Analytical Inc. (EAI) Certification Number 1012
Authorized Representative: Lorraine Olashaw
Analytical Subcontractor: Frontier Global Sciences Certification Number E87575

SAMPLE COLLECTION

Sampler: Paul Pepler, GZA
Sample Type: Grab
Sample Date : 2/16/2013 Sample Time 2:10 PM
pH: 7.12
Waste Stream: Softened Stream A

CATEGORICAL PRETREATMENT STANDARDS

40 CFR 423.16: Steam Electric Power Generating Category
NOTE: There are no numerical pretreatment standards for this source

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

3/28/2013
Date

CONFIDENTIAL BUSINESS INFORMATION

TABLE 1 - SUMMARY OF ANALYTICAL DATA
FEBRUARY 2013
 Public Service Company of New Hampshire
 Merrimack Station
 Bow, New Hampshire

PARAMETER	SOFTENED STREAM A RESULTS 2/16/2013 (mg/L)
Arsenic	<0.00750
Copper	<0.00500
Molybdenum	0.0552
Nickel	0.00709
pH	7.12
Selenium	0.0517
Sodium	3,050
TDS	27,000
TSS	<5

TABLE 2
SUMMARY OF WASTEWATER SHIPMENTS TO HOOKSETT WASTEWATER TREATMENT PLANT
FEBRUARY 2013
Public Service Company of New Hampshire
Merrimack Station
Bow, New Hampshire

DATE	DAY	TICKET	TRUCKING COMPANY	pH	VOLUME	TOTAL DAILY VOLUME (gallons)
2/15/2013	Friday	26003	Enpro	7.7	8,000	8,000
2/16/2013	Saturday	25975	Enpro	7.62	8,000	48,000
		25959	Enpro	7.5	8,000	
		25960	Enpro	7.35	8,000	
		25971	Enpro	7.1	8,000	
		25972	Enpro	7.06	8,000	
		25973	Enpro	7.14	8,000	
2/17/2013	Sunday	25974	Enpro	6.98	8,000	8,000
2/22/2013	Friday	25988	Enpro	7.88	6,000	18,000
		25984	Enpro	7.72	6,000	
		25983	Enpro	7.63	6,000	
2/23/2013	Saturday	25985	Enpro	7.85	6,000	24,000
		25986	Enpro	7.91	6,000	
		26004	Enpro	7.99	6,000	
		26005	Enpro	8.31	6,000	
2/26/2013	Tuesday	26006	Enpro	8.21	8,000	24,000
		26007	Enpro	8.23	8,000	
		26008	Enpro	8.25	8,000	
2/27/2013	Wednesday	26009	Enpro	8.42	8,000	40,000
		26010	Enpro	8.23	8,000	
		26011	Enpro	8.1	8,000	
		26012	Enpro	7.81	8,000	
		26013	Enpro	8.12	8,000	
2/28/2013	Thursday	26014	Enpro	8.08	8,000	16,000
		26066	Enpro	7.79	8,000	

Shipments (Number of Trucks)	25
Maximum Truck Volume (Gallons)	8,000
Total Volume Discharged (Gallons)	186,000
Maximum Daily Flow (gallons per day)	48,000
Average Daily Flow (gallons per discharge day)	23,250

PERMITTED FLOW

Treated Blowdown from Flue Gas Desulfurization (FGD) System (Stream A).....100,000 gallons per day
Treated Blowdown from Flue Gas Desulfurization (FGD) System (Softened Stream A)..... 100,000 gallons per day
Noncontact Cooling Water generated in association with the FGD treatment System.....100,000 gallons per day
Distillate generated in association with the FGD treatment system100,000 gallons per day

NOTE: The total volume of all waste streams discharged shall not exceed 100,000 gallons per day.



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



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 118261
Client Identification: PSNH-MK
Date Received: 2/7/2013

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

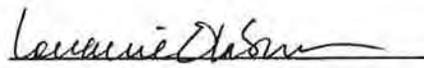
Eastern Analytical Inc. maintains certification in the following states: Connecticut (PH-0492), Maine (NH005), Massachusetts (M-NH005), New Hampshire/NELAP (1012), Rhode Island (269) and Vermont (VT1012).

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

2.14.13
Date

4
of pages (excluding cover letter)

3 4



SAMPLE CONDITIONS PAGE

EAI ID#: 118261

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

Client Designation: **PSNH-MK**

Temperature upon receipt (°C): **16.3**

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)
118261.01	Softened Stream A WW	2/7/13	2/7/13	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. 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 : Inorganics, 19th Edition, 1995; Microbiology, 20th Edition, 1998
- 3) Test Methods for Evaluating Solid Waste SW 846 3rd Edition including updates IVA and IVB
- 4) Hach Water Analysis Handbook, 2nd edition, 1992

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LABORATORY REPORT

EAI ID#: 118261

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

Client Designation: **PSNH-MK**

Sample ID: Softened Stream A
WW

Lab Sample ID: 118261.01

Matrix: aqueous

Date Sampled: 2/7/13

Date Received: 2/7/13

BOD < 6

Analysis			
Units	Date	Time	Method Analyst
mg/L	2/08/13	12:05	5210B SCW



QC REPORT

EAI ID#: 118261

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

Client Designation: **PSNH-MK**

Parameter Name	Blank	LCS	LCSD	Units	Date of Analysis	Limits	RPD	Method
BOD	< 6	390 (98 %R)	410 (103 %R) (5 RPD)	mg/L	2/8/13	84 - 115	20	5210B

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.



Eastern Analytical, Inc.

Professional laboratory & drilling services

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



Subject: Laboratory Report

Eastern Analytical, Inc. ID: 118444
Client Identification: PSNH-MK
Date Received: 2/19/2013

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.

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- %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

3-21-13
Date

22
of pages (excluding cover letter)



SAMPLE CONDITIONS PAGE

EAI ID#: 118444

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

Client Designation: **PSNH-MK**

Temperature upon receipt (°C): 4

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)
118444.01	Softened Stream A WW	2/19/13	2/16/13	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

Eastern Analytical, Inc.

www.eailabs.com | 800.287.0525 | customerservice@eailabs.com
CONFIDENTIAL BUSINESS INFORMATION



LABORATORY REPORT

EAI ID#: 118444

Client: GZA GeoEnvironmental, Inc. (NH)

Client Designation: PSNH-MK

Sample ID: Softened Stream A
WW

Lab Sample ID: 118444.01

Matrix: aqueous

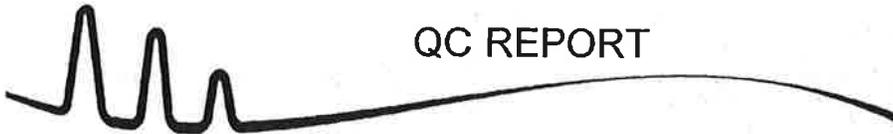
Date Sampled: 2/16/13

Date Received: 2/19/13

Solids Suspended < 5

Solids Dissolved 27000

Units	Analysis		Method	Analyst
	Date	Time		
mg/L	2/21/13	8:50	2540D	SCW
mg/L	2/21/13	10:35	2540C	SCW



QC REPORT

EAI ID#: 118444

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

Client Designation: **PSNH-MK**

Parameter Name	Blank	LCS	LCSD	Units	Date of Analysis	Limits	RPD	Method
Solids Suspended	< 5	92 (92 %R)	96 (96 %R) (4 RPD)	mg/L	2/21/13	90 - 110	20	2540D
Solids Dissolved	< 5	980 (98 %R)	NA	mg/L	2/21/13	85 - 115		2540C

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.



Frontier Global Sciences

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Phone: 425-686-1996
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20 March 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,

A handwritten signature in cursive script that reads "Liz Siska".

Liz Siska
Project Manager



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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 A WW	1302312-01	Water	16-Feb-13 14:10	20-Feb-13 09:25

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Liz Siska, Project Manager

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CASE NARRATIVE

SAMPLE RECEIPT

One (1) water sample was received on February 20th, 2013 at Eurofins Frontier Global Sciences (EFGS). The sample was received intact, on-ice within a cooler at 1.4 degrees Celsius. Shortly after receipt the client called to cancel the mercury analysis on the received sample and field blank.

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 collision cell.

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.

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CHAIN OF CUSTODY FORMS

CHAIN-OF-CUSTODY RECORD eastern analytical professional laboratory services

EAI SRB# **118444**

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
Softened Stream A WW	2/16/2013 14:10	aqueous	Surface Water Low Level Metals	1302312

No COC seal, Recd @ 1.4°C TTD 5225 Shipped UPS 12 X16 599 13 9249 5481 VTSR 0925

EAI SRB# **118444** 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
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, Cu, Mo, Ni, Se, Na

Eastern Analytical Inc. PO Number: 39938

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

Samples Collected by:
Liz Siska 2/19/13 15:30 UPS

Relinquished by	Date/Time	Received by
<u>UPS</u>	<u>2/20/13 0925</u>	<u>[Signature]</u>
Relinquished by	Date/Time	Received by
		<u>[Signature]</u>

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

As a subcontract lab to EAI, you will defend, indemnify and hold Eastern Analytical, Inc., its officers, employees, and agents harmless from and against any and all liability, loss, expense or claims for injury or damages arising out of the performance against this chain of custody but only in proportion to and to the extent such liability, loss, expense, or claims for injury or damages are caused by or result from the negligent or intentional acts or omissions of you as a subcontract lab, your officers, agents or employees

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Liz Siska, Project Manager

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CHAIN OF CUSTODY FORMS

FGS Work Order: 1302312

Sample Receipt Checklist

Frontier Global Sciences

Client: Eastern Analytical Date & Time Received: 2/20/13 0925 Date Logged In: 2/20/13 Date Labeled: 2/20/13

Project: _____ Received By: CS Logged By: CS Labeled By: CS

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

Tracking/Airbill Number(s): UPS 12 446 57113 9249 5481

Thermal Preservation: _____ None (Ambient) Loose Ice _____ Gel/Blue Ice _____ Other (Specify: _____) Thermal Preservation Required: N

Cooler Information:	Y/N	Comments	Thermometer ID:	CF: <u>4-0.5°C</u>			
The coolers do not appear to be tampered with:	<u>Y</u>		Cooler 1: <u>1A</u> °C	Cooler 4: °C	Cooler 7: °C	Cooler 10: °C	
Custody Seals are present and intact:	<u>N</u>	<u>None used</u>	Cooler 2: °C	Cooler 5: °C	Cooler 8: °C	Cooler 11: °C	
Custody seals signed by:	<u>N/A</u>		Cooler 3: °C	Cooler 6: °C	Cooler 9: °C	Cooler 12: °C	

Chain of Custody:	Y/N	Comments
Sample ID/Description:	<u>N</u>	<u>Only lists one of three bottles</u>
Date/Time of collection:	<u>Y</u>	<u>sent in cooler</u>
Sampled by:	<u>N</u>	
Preservation type:	<u>N/A</u>	
Requested analyses:	<u>N</u>	<u>Only lists analyses for the listed samples</u>
Required signatures:	<u>Y</u>	<u>not here since here</u>
Internal COC required:	<u>N</u>	

Sample Condition/Integrity:	Y/N	Comments
Sample containers intact:	<u>Y</u>	
Sample labels are present and legible:	<u>Y</u>	
Sample ID on container matches COC:	<u>N</u>	<u>2 samples not on tag</u>
Correct sample containers used:	<u>Y</u>	
Samples received within holding times:	<u>Y</u>	
Sample volume sufficient for requested analyses:	<u>Y</u>	
Correct preservative used for requested analyses:	<u>N/A</u>	
pH of preserved samples verified and recorded:	<u>N/A</u>	

Client Contacted: _____ Date/Time: _____ Method: _____

Anomalies/Non-conformances (attach additional pages if needed):

Discussion/Resolution:

Information for second and third bottles taken from bottle labels. Analyte information confirmed by LS - CS 2/20/13

FGS Sample Receipt Checklist Revision 2; 07/09/2012

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Liz Siska

Liz Siska, Project Manager

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ANALYTICAL RESULTS

Softened Stream A WW

Matrix: Water
Laboratory ID: 1302312-01

Analyte	Result	MDL	MRL	Units	Dilution	Batch	Sequence	Analyzed	Method	Notes
Arsenic	ND	-	7.50	µg/L	50	F303054	3C19009	03/18/13	EPA 200.8	U, R-05
Copper	ND	-	5.00	µg/L	50	F303054	3C12007	03/12/13	EPA 200.8	R-05, U
Molybdenum	55.2	-	3.00	µg/L	50	F303054	3C18006	03/16/13	EPA 200.8	R-05
Nickel	7.09	-	5.00	µg/L	50	F303054	3C12007	03/12/13	EPA 200.8	R-05
Selenium	51.7	-	30.0	µg/L	50	F303054	3C12007	03/12/13	EPA 200.8	R-05
Sodium	3050000	-	200000	µg/L	10000	F303054	3C12007	03/12/13	EPA 200.8	R-05

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1302312-01

Batch: F303054

Sequence: 3C12007

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F303054-MS/MSD1

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Sodium	3046000	5578.4	3042000	-71.7	70 - 130	EPA 200.8	QM-02

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	5578.4	3076000	542	1.12	70 - 130	20	EPA 200.8	QM-02

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1302312-01RE1

Batch: F303054

Sequence: 3C12007

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F303054-MS/MSD2

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Nickel	7.09	4.0600	11.34	105	70 - 130	EPA 200.8	
Copper	ND	4.0600	4.70	116	70 - 130	EPA 200.8	
Arsenic	3.06	15.225	17.46	94.6	70 - 130	EPA 200.8	
Selenium	51.71	30.450	79.91	92.6	70 - 130	EPA 200.8	QM-02

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Nickel	4.0600	11.42	107	0.704	70 - 130	20	EPA 200.8	
Copper	4.0600	4.70	116	0.0326	70 - 130	20	EPA 200.8	
Arsenic	15.225	16.42	87.8	6.17	70 - 130	20	EPA 200.8	
Selenium	30.450	68.13	53.9	15.9	70 - 130	20	EPA 200.8	QM-02

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1302312-01

Batch: F303054

Sequence: 3C12007

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F303054-MS/MSD3

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Sodium	3046000	20300000	21290000	89.9	70 - 130	EPA 200.8	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Sodium	20300000	21020000	88.5	1.31	70 - 130	20	EPA 200.8	AS

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1302312-01RE1

Batch: F303054

Sequence: 3C12007

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F303054-MS/MSD4

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Nickel	7.09	1268.8	1260	98.8	70 - 130	EPA 200.8	AS
Copper	ND	1268.8	1208	95.2	70 - 130	EPA 200.8	AS
Arsenic	3.06	1015.0	1033	101	70 - 130	EPA 200.8	AS
Selenium	51.71	1015.0	1040	97.4	70 - 130	EPA 200.8	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Nickel	1268.8	1259	98.7	0.121	70 - 130	20	EPA 200.8	AS
Copper	1268.8	1214	95.7	0.568	70 - 130	20	EPA 200.8	AS
Arsenic	1015.0	1028	101	0.524	70 - 130	20	EPA 200.8	AS
Selenium	1015.0	1090	102	4.66	70 - 130	20	EPA 200.8	AS

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD

SOURCE: 1302312-01RE2

Batch: F303054

Sequence: 3C18006

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F303054-MS/MSD5

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Molybdenum	55.17	2.0300	57.58	119	70 - 130	EPA 200.8	QM-02

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Molybdenum	2.0300	55.92	37.1	2.92	70 - 130	20	EPA 200.8	QM-02

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Liz Siska, Project Manager

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MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY AND RPD
SOURCE: 1302312-01RE2
Batch: F303054
Sequence: 3C18006
Preparation: Closed Vessel Nitric Oven Digestion
Lab Number: F303054-MS/MSD6

Analyte	Sample Concentration (µg/L)	Spike Added (µg/L)	MS Concentration (µg/L)	MS % Recovery	Recovery Limits	Method	Notes
Molybdenum	55.17	507.50	560.7	99.6	70 - 130	EPA 200.8	AS

Analyte	Spike Added (µg/L)	MSD Concentration (µg/L)	MSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Molybdenum	507.50	578.3	103	3.08	70 - 130	20	EPA 200.8	AS

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LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE

RECOVERY AND RPD

Batch: F303054

Sequence: 3C12007

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F303054-BS/BSD1

LCS Source: Blank Spike

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Sodium	5496.0	4756	86.5	85 - 115	EPA 200.8	
Nickel	4.0000	3.94	98.6	85 - 115	EPA 200.8	
Copper	4.0000	3.93	98.3	85 - 115	EPA 200.8	
Arsenic	15.000	14.36	95.8	85 - 115	EPA 200.8	
Selenium	30.000	28.50	95.0	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	4971	90.4	4.43	85 - 115	20	EPA 200.8	
Nickel	4.0000	3.97	99.3	0.790	85 - 115	20	EPA 200.8	
Copper	4.0000	3.98	99.5	1.22	85 - 115	20	EPA 200.8	
Arsenic	15.000	14.35	95.7	0.0951	85 - 115	20	EPA 200.8	
Selenium	30.000	30.26	101	5.98	85 - 115	20	EPA 200.8	

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LABORATORY CONTROL SAMPLE/ LABORATORY CONTROL SAMPLE DUPLICATE
RECOVERY AND RPD

Batch: F303054

Sequence: 3C18006

Preparation: Closed Vessel Nitric Oven Digestion

Lab Number: F303054-BS/BSD2

LCS Source: Blank Spike

Analyte	Spike Added (µg/L)	LCS Concentration (µg/L)	LCS % Recovery	Recovery Limits	Method	Notes
Molybdenum	2.0000	1.752	87.6	85 - 115	EPA 200.8	

Analyte	Spike Added (µg/L)	LCSD Concentration (µg/L)	LCSD % Recovery	% RPD	Recovery Limits	RPD Limit	Method	Notes
Molybdenum	2.0000	1.767	88.3	0.838	85 - 115	20	EPA 200.8	

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PREPARATION BLANKS

Instrument: ICPMS-6

Sequence: 3C12007

Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MDL	MRL	Units	Batch	Method	Notes
F303054-BLK1	Sodium	1	1	20	µg/L	F303054	EPA 200.8	U
F303054-BLK1	Nickel	-0.003	0.01	0.10	µg/L	F303054	EPA 200.8	U
F303054-BLK1	Copper	-0.005	0.01	0.10	µg/L	F303054	EPA 200.8	U
F303054-BLK1	Selenium	-0.007	0.31	0.60	µg/L	F303054	EPA 200.8	U

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PREPARATION BLANKSInstrument: ICPMS-6Sequence: 3C14010Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MDL	MRL	Units	Batch	Method	Notes
F303054-BLK2	Arsenic	0.08	0.04	0.15	µg/L	F303054	EPA 200.8	U

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PREPARATION BLANKS

Instrument: ICPMS-3

Sequence: 3C18006

Preparation: Closed Vessel Nitric Oven Digestion

Lab Sample ID	Analyte	Found	MDL	MRL	Units	Batch	Method	Notes
F303054-BLK3	Molybdenum	0.008	0.008	0.060	µg/L	F303054	EPA 200.8	U

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Liz Siska, Project Manager

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Notes and Definitions

- U Analyte included in the analysis, but not detected
- 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.
- 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

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