

MAY 6, 2014

WSCF Laboratory

PO Box 650 S3-30
Richland, WA 99352



May 6, 2014

Scot Fitzgerald
CH2M-HILL PRC
PO Box 1600
Richland, WA 99352

Dear Scot Fitzgerald,

FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF140626

Reference: (1) SOW, Mod 2, #36587, Release 3
(2) MSC-SD-CD-QAPP-017, current version, Waste Sampling & Characterization Facility Quality Assurance Program Plan

This letter contains the following information for sample delivery group WSCF140626

- * Cover Sheet (Attachment 1)
- * Narrative (Attachment 2)
- * Analytical Results (Attachment 3)
- * Sample Receipt Information (Attachment 4)

Very truly yours,

A handwritten signature in black ink, appearing to read "Joseph Hale", is positioned above the typed name.

Electronically signed by Joseph Hale

For Lab Manager, Dan T. Smith

WSCF Analytical Lab

(509) 373-4804

Attachments 4

CC: w/Attachments

File/LB

ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF Number Cross Reference

Group # WSCF140626

Data Deliverable Date 05/08/14

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
W14-004	B2W5J7	140626001	WATER	04/07/14	04/07/14
W14-004	B2W5J8	140626002	WATER	04/07/14	04/07/14
W14-004	B2W5J6	140626003	WATER	04/07/14	04/07/14
W14-004	B2W613	140626004	WATER	04/07/14	04/07/14
W14-004	B2W614	140626005	WATER	04/07/14	04/07/14
W14-004	B2W615	140626006	WATER	04/07/14	04/07/14
S14-004	B2W7Y1	140626007	WATER	04/07/14	04/07/14

ATTACHMENT 2

NARRATIVE

Consisting of 4 pages
Including cover page

Introduction

Samples were received at the WSCF laboratory as referenced on the WSCF SAF Number Cross Reference table included in the final report. The samples were analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW)*, to Contract 39818, Revision 4, "WSCF ANALYTICAL SERVICES FOR GROUNDWATER."

The narrative (Attachment 2) will address sample characteristics, analyses requested and general information in performance of the analytical methods. A Data Summary Report (Attachment 3) includes analytical results, a comment report detailing method abnormalities, tentatively identified peaks if applicable, method references, and Laboratory QC information as applicable. Copies of the chain of custody and sample receipt documentation are included as Attachment 4.

It should be noted that the attached chain of custody was not stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving. However, based on procedure LO-090-403 form "NOTICE OF IMPROPER SAMPLE SUBMITTAL" was not submitted and was not stamped "NOT ICED". No anomaly was noted during sample receipt.

The following generic data qualifiers (i.e., B, C, D, J and U) may be applicable to this report, as appropriate.

- **B** – Sample results with a concentration greater than the MDL but less than the PQL are B flagged (applies to inorganic and wet chemical analyses), as appropriate.
- **C** – Analyte was detected in the blank and was evaluated. Affected sample results in the batch were C flagged (applies to inorganic and wet chemical analyses).
- **D** – Sample results are D flagged if dilution(s) were required, as appropriate.
- **J** – Sample results with a concentration greater than the MDL but less than the PQL are J flagged (applies to organic analyses), as appropriate.
- **B (organic analyses)** – Analyte was detected in the blank and was evaluated. Affected sample results in the batch were B flagged.
- **U** – Analyzed for but not detected above limiting criteria. Relative Percent Difference (RPD) values associated with an analyte qualified with a "U" are not applicable.
- **o** – LCS recovery outside established laboratory acceptance limits.

Analytical Methodology for Requested Analyses

Refer to *WSCF Method References Report* for a complete listing of approved analytical methods.

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Nitrate, Chloride and Sulfate – Exceeded spiking levels by a factor of 4. Spike recoveries and associated RPDs are not valid.
- All other applicable QC controls are within the established limits.

ICP-AES Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Calcium – Exceeded spiking levels by a factor of 4. Spike recoveries and associated RPDs are not valid.
- All other applicable QC controls are within the established limits.

ICP-MS Metals – The hold time requirements for this analysis were met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- All applicable QC controls are within the established limits.

Total Alkalinity – The hold time requirement for this analysis was met. A Duplicate and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- All applicable QC controls are within the established limits.

Total Organic Carbon – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- All applicable QC controls are within the established limits.

Total Organic Halides – The hold time requirement for this analysis was met. A Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- All applicable QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – The hold time requirement for this analysis was met. A Duplicate, Matrix Spike (Matrix Spikes apply only to Technetium & Tritium), Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

Tritium:

Attachment 2
Narrative
WSCF140626

- All applicable QC controls are within the established limits.

Technetium-99:

- All applicable QC controls are within the established limits.

We certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package has been authorized by the Analytical Laboratory Manager (or designee) and the Client Services representative as verified by electronic signatures shown on the WSCF ANALYTICAL RESULTS REPORT.

ATTACHMENT 3

ANALYTICAL RESULTS

Consisting of 38 pages
Including cover page

WSCF ANALYTICAL RESULTS REPORT

For

CH2M Hill Plateau Remediation

PO Box 1600
Richland, WA 99352

Attention: Scot Fitzgerald

Contract # MOA-FH-CHPRC-2008
Group # WSCF140626
Report Date May 6, 2014

Analytical: Electronically signed by Joseph Hale

Client Services: Electronically signed by Marisol Avila

Solid samples results that have a 'Percent Solid' test are reported on a "dry weight basis", except results of TCLP, Percent Solid, and Total Activity. If no 'Percent Solid' test is reported then the results are reported on an "as received" basis.

This information is intended for the use of the addressee only. If the reader of this report is not the intended recipient or is not authorized by the recipient to receive the report, you are hereby notified that any dissemination, distribution or copying of this report is strictly prohibited. If you have received this report in error, please notify WSCF Laboratory immediately by telephone at (509) 373-7005. Information designation of this report is the responsibility of the customer.

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF140626

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
231237	231237	2	BLANK	108494	BLANK		Anions by Ion Chromatography (Water)
231237	231237	3	LCS	108495	LCS		Anions by Ion Chromatography (Water)
231237	231237	4	MS	108496	B2W5K1(140629001MS)	140629001	Anions by Ion Chromatography (Water)
231237	231237	5	MSD	108497	B2W5K1(140629001MSD)	140629001	Anions by Ion Chromatography (Water)
231237	231237	10	SAMPLE	140626001	B2W5J7		Anions by Ion Chromatography (Water)
231244	232244	5	BLANK	108543	BLANK		ICP-6010 - All possible metals
231244	232244	7	LCS	108545	LCS		ICP-6010 - All possible metals
231244	232244	9	MS	108546	B2W5L4(140615015MS)	140615015	ICP-6010 - All possible metals
231244	232244	10	MSD	108547	B2W5L4(140615015MSD)	140615015	ICP-6010 - All possible metals
231244	232244	22	SAMPLE	140626002	B2W5J8		ICP-6010 - All possible metals
231244	232244	23	SAMPLE	140626003	B2W5J6		ICP-6010 - All possible metals
232361	232362	1	BLANK	109481	BLANK		Total Organic Halides
232361	232362	2	LCS	109482	LCS		Total Organic Halides
232361	232362	20	MS	109488	B2W615(140626006MS)	140626006	Total Organic Halides
232361	232362	21	MSD	109489	B2W615(140626006MSD)	140626006	Total Organic Halides
232361	232362	22	SAMPLE	140626006	B2W615		Total Organic Halides
232363	232365	1	BLANK	109490	BLANK		Total Organic Halides
232363	232365	2	LCS	109491	LCS		Total Organic Halides
232363	232365	14	MS	109495	B2W636(140623006MS)	140623006	Total Organic Halides
232363	232365	15	MSD	109496	B2W636(140623006MSD)	140623006	Total Organic Halides
232363	232365	17	SAMPLE	140626003	B2W5J6		Total Organic Halides
232363	232365	18	SAMPLE	140626004	B2W613		Total Organic Halides
232363	232365	19	SAMPLE	140626005	B2W614		Total Organic Halides

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF140626

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
232555	232561	4	BLANK	109661	BLANK		3E-2008 ICP-MS 3 Elements
232555	232561	5	LCS	109662	LCS		3E-2008 ICP-MS 3 Elements
232555	232561	7	MS	109663	B2W820(140622007MS)	140622007	3E-2008 ICP-MS 3 Elements
232555	232561	8	MSD	109664	B2W820(140622007MSD)	140622007	3E-2008 ICP-MS 3 Elements
232555	232561	10	SAMPLE	140626007	B2W7Y1		3E-2008 ICP-MS 3 Elements

Batch QC List

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140626

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
231036	231865	1	BLANK	108441	BLANK		Tritium by LSC
231036	231865	2	LCS	108442	LCS		Tritium by LSC
231036	231865	4	DUP	108443	B2W904(140608001DUP)	140608001	Tritium by LSC
231036	231865	5	MSPK	108444	B2W904(140608001MSP)		Tritium by LSC
231036	231865	15	SAMPLE	140626007	B2W7Y1		Tritium by LSC
231268	231735	1	BLANK	108585	BLANK		TC99 by Liquid Scintillation
231268	231735	2	LCS	108586	LCS		TC99 by Liquid Scintillation
231268	231735	4	DUP	108587	B2W820(140622007DUP)	140622007	TC99 by Liquid Scintillation
231268	231735	5	MS	108588	B2W820(140622007MS)	140622007	TC99 by Liquid Scintillation
231268	231735	7	SAMPLE	140626007	B2W7Y1		TC99 by Liquid Scintillation

Batch QC List

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140626

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
231437	231437	1	LCS	108614	LCS		Total Alkalinity as mg/L CaCO3 (Water)
231437	231437	2	DUP	108615	B2W5H4(140615002DUP	140615002	Total Alkalinity as mg/L CaCO3 (Water)
231437	231437	9	SAMPLE	140626003	B2W5J6		Total Alkalinity as mg/L CaCO3 (Water)
231437	231437	13	LCS	108616	LCS		Total Alkalinity as mg/L CaCO3 (Water)
232348	232348	2	BLANK	109436	BLANK		Total Organic Carbon
232348	232348	3	LCS	109437	LCS		Total Organic Carbon
232348	232348	4	MS	109438	B2W5J6(140626003MS)	140626003	Total Organic Carbon
232348	232348	5	MSD	109439	B2W5J6(140626003MSD)	140626003	Total Organic Carbon
232348	232348	6	SAMPLE	140626003	B2W5J6		Total Organic Carbon
232348	232348	7	SAMPLE	140626004	B2W613		Total Organic Carbon
232550	232550	2	BLANK	109644	BLANK		Total Organic Carbon
232550	232550	3	LCS	109645	LCS		Total Organic Carbon
232550	232550	4	MS	109646	B2W614(140626005MS)	140626005	Total Organic Carbon
232550	232550	5	MSD	109647	B2W614(140626005MSD)	140626005	Total Organic Carbon
232550	232550	6	SAMPLE	140626005	B2W614		Total Organic Carbon
232550	232550	7	SAMPLE	140626006	B2W615		Total Organic Carbon

Method Reference

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF140626

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory, industry methods or HEIS methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

LA-505-411	Elemental Analysis by ICP Atomic Emission Spectroscopy (ICP AES)		
	EPA SW-846	6010C	Inductively Coupled Plasma-Atomic Emission Spectrometry
	HEIS	6010_METALS_ICP	Inductively Coupled Plasma-Atomic Emission Spectrometry
LA-505-412	Determination of Trace Elements in Waters & Wastes by ICP Mass Spectrometry		
	EPA-600/R-94-111	200.8	Determination of Trace Elements in Waters and Waste by Inductively Coupled Plasma
	HEIS	200.8_METALS_ICPMS	Determination of Trace Elements in Waters and Waste by Inductively Coupled Plasma, Mass Spec.
LA-523-444	Total Organic Halides Based on SW-846 Method 9020B		
	EPA SW-846	9020B	Total Organic Halides (TOX)
	HEIS	9020_TOX	Total Organic Halides (TOX)
LA-533-410	Anion Analysis by Ion Chromatography		
	EPA-600/R-94-111	300.0	Determination of Inorganic Anions by Ion Chromatography
	HEIS	300.0_ANIONS_IC	Determination of Inorganic Anions by Ion Chromatography

Note: A complete list of WSCF analytical procedures and reference regulatory or industry methods is available online at <http://www7.rl.gov/rapidweb/AS-DOL/index.cfm>

Method Reference

Attention Scot Fitzgerald
Department Radiochemistry

Group # WSCF140626

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory, industry methods or HEIS methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

LA-218-413	Tritium By Ion Removal Using Eichrom Resin Columns (Prep)		
	N/A	PREP METHOD	
LA-438-402	Determination of Technetium-99 by RAD Disk Filtration & Liquid Scintillation Counting		
	N/A	PREP METHOD	
LA-508-421	Operation of the Tri-Carb Model 2500TR Liquid Scintillation Analyzer		
	HEIS	ALPHA_LSC	A/B Liquid Scintillation
	HEIS	BETA_LSC	A/B Liquid Scintillation
	HEIS	TC99_3MDSK_LSC	TC99 by Liquid Scintillation
	HEIS	TRITIUM_EIE_LSC	Tritium, by Eichrome ion exchange, LSC

Note: A complete list of WSCF analytical procedures and reference regulatory or industry methods is available online at <http://www7.rl.gov/rapidweb/AS-DOL/index.cfm>

Method Reference

Attention Scot Fitzgerald
Department Wet Chemistry

Group # WSCF140626

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory, industry methods or HEIS methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

LA-531-411	Alkalinity		
	SM	2320	Alkalinity
	HEIS	2320_ALKALINITY	Alkalinity
LA-344-406	Total Organic Carbon (TOC) Based on SW-846		
	EPA SW-846	9060	Total Organic Carbon
	HEIS	9060_TOC	Total Organic Carbon

Note: A complete list of WSCF analytical procedures and reference regulatory or industry methods is available online at <http://www7.rl.gov/rapidweb/AS-DOL/index.cfm>

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Sample # 140626001
 SAF# W14-004
 Sample ID B2W5J7

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
04/07/14										
Anions by Ion Chromatography (Water)										
Fluoride	16984-48-8	LA-533-410	BD	0.314		ug/mL	2	0.050	1.0	04/07/14
Chloride	16887-00-6	LA-533-410	D	24.4		ug/mL	2	0.12	0.80	04/07/14
Nitrite-N	NO2-N	LA-533-410	UD	<0.040		ug/mL	2	0.040	0.20	04/07/14
Nitrate-N	NO3-N	LA-533-410	D	2.98		ug/mL	2	0.040	0.20	04/07/14
Sulfate	14808-79-8	LA-533-410	D	89.1		ug/mL	2	0.22	1.1	04/07/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Sample # 140626002
 SAF# W14-004
 Sample ID B2W5J8

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPAES Prep (W)										04/23/14
ICP-6010 - All possible metals										
Iron	7439-89-6	LA-505-411	U	<40		ug/L	1	40	50	04/23/14
Magnesium	7439-95-4	LA-505-411		14500		ug/L	1	60	750	04/23/14
Manganese	7439-96-5	LA-505-411	U	<4.0		ug/L	1	4.0	5.0	04/23/14
Nickel	7440-02-0	LA-505-411	U	<10		ug/L	1	10	40	04/23/14
Potassium	7440-09-7	LA-505-411		7130		ug/L	1	250	4000	04/23/14
Silver	7440-22-4	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Sodium	7440-23-5	LA-505-411		24100		ug/L	1	100	500	04/23/14
Antimony	7440-36-0	LA-505-411	U	<20		ug/L	1	20	60	04/23/14
Barium	7440-39-3	LA-505-411		38.8		ug/L	1	4.0	20	04/23/14
Cadmium	7440-43-9	LA-505-411	U	<4.0		ug/L	1	4.0	5.0	04/23/14
Chromium	7440-47-3	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Cobalt	7440-48-4	LA-505-411	U	<4.0		ug/L	1	4.0	20	04/23/14
Copper	7440-50-8	LA-505-411	U	<4.0		ug/L	1	4.0	8.0	04/23/14
Vanadium	7440-62-2	LA-505-411	B	19.0		ug/L	1	5.0	25	04/23/14
Zinc	7440-66-6	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Calcium	7440-70-2	LA-505-411		54000		ug/L	1	50	1000	04/23/14
Strontium	7440-24-6	LA-505-411		270		ug/L	1	8.0	10	04/23/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Sample # 140626002
 SAF# W14-004
 Sample ID B2W5J8

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Arsenic	7440-38-2	LA-505-411	U	<25		ug/L	1	25	30	04/23/14
Beryllium	7440-41-7	LA-505-411	U	<2.0		ug/L	1	2.0	4.0	04/23/14

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 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Sample # 140626003
 SAF# W14-004
 Sample ID B2W5J6

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPAES Prep (W)										
ICP-6010 - All possible metals										
Iron	7439-89-6	LA-505-411		69.3		ug/L	1	40	50	04/23/14
Magnesium	7439-95-4	LA-505-411		14400		ug/L	1	60	750	04/23/14
Manganese	7439-96-5	LA-505-411	U	<4.0		ug/L	1	4.0	5.0	04/23/14
Nickel	7440-02-0	LA-505-411	U	<10		ug/L	1	10	40	04/23/14
Potassium	7440-09-7	LA-505-411		7040		ug/L	1	250	4000	04/23/14
Silver	7440-22-4	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Sodium	7440-23-5	LA-505-411		23900		ug/L	1	100	500	04/23/14
Antimony	7440-36-0	LA-505-411	U	<20		ug/L	1	20	60	04/23/14
Barium	7440-39-3	LA-505-411		37.6		ug/L	1	4.0	20	04/23/14
Cadmium	7440-43-9	LA-505-411	U	<4.0		ug/L	1	4.0	5.0	04/23/14
Chromium	7440-47-3	LA-505-411	B	8.82		ug/L	1	5.0	10	04/23/14
Cobalt	7440-48-4	LA-505-411	U	<4.0		ug/L	1	4.0	20	04/23/14
Copper	7440-50-8	LA-505-411	U	<4.0		ug/L	1	4.0	8.0	04/23/14
Vanadium	7440-62-2	LA-505-411	B	18.7		ug/L	1	5.0	25	04/23/14
Zinc	7440-66-6	LA-505-411	U	<5.0		ug/L	1	5.0	10	04/23/14
Calcium	7440-70-2	LA-505-411		53500		ug/L	1	50	1000	04/23/14
Strontium	7440-24-6	LA-505-411		266		ug/L	1	8.0	10	04/23/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Sample # 140626003
 SAF# W14-004
 Sample ID B2W5J6

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Arsenic	7440-38-2	LA-505-411	U	<25		ug/L	1	25	30	04/23/14
Beryllium	7440-41-7	LA-505-411	U	<2.0		ug/L	1	2.0	4.0	04/23/14
Preparation for TOX (W)										04/15/14
Total Organic Halides										
Total Organic Halides	59473-04-0	LA-523-444	B	8.70		ug/L	1	5.0	15	04/15/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Sample # 140626004
 SAF# W14-004
 Sample ID B2W613

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Preparation for TOX (W)										04/15/14
Total Organic Halides										
Total Organic Halides	59473-04-0	LA-523-444	B	10.8		ug/L	1	5.0	15	04/15/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Sample # 140626005
 SAF# W14-004
 Sample ID B2W614

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Preparation for TOX (W)										04/15/14
Total Organic Halides										
Total Organic Halides	59473-04-0	LA-523-444	B	12.1		ug/L	1	5.0	15	04/15/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Sample # 140626006
 SAF# W14-004
 Sample ID B2W615

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Preparation for TOX (W)										04/15/14
Total Organic Halides										
Total Organic Halides	59473-04-0	LA-523-444	B	13.6		ug/L	1	5.0	15	04/15/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Sample # 140626007
 SAF# S14-004
 Sample ID B2W7Y1

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPMS Prep 3-Elements (W)										04/30/14
3E-2008 ICP-MS 3 Elements										
Uranium	7440-61-1	LA-505-412	D	3.72		ug/L	2	0.10	0.50	05/05/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the PQL(or EQL)but >= the IDL/MDL(Inorganic)
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 E - Analyte is an estimate, see comment section.
 N - MS and/or MSD recovery outside control limits.

U - Analyzed for but not detected above limiting criteria.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140626

Sample # 140626007
 SAF# S14-004
 Sample ID B2W7Y1

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
TC99 by Liquid Scin. WATER/LIQUID PREP										04/10/14
TC99 by Liquid Scintillation										
Technetium-99	14133-76-7	LA-508-421	U	-2.9	3.9	pCi/L	1	6.6		04/11/14
Tritium by LSC EICHROM WA/LIQ PREP										04/09/14
Tritium by LSC										
Tritium	10028-17-8	LA-508-421	U	200	180	pCi/L	1	290		04/14/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - The associated QC sample Blank has a result > or = the MDA
 U - Analyzed for but not detected above limiting criteria.
 N - Spike Recovery is Outside Control Limits.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)

o - LCS recovery outside established laboratory acceptance limits.

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140626

Sample # 140626003
 SAF# W14-004
 Sample ID B2W5J6

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
04/09/14										
Total Alkalinity as mg/L CaCO3 (Water)										
Total Alkalinity as CaCO3	ALKALINITY	LA-531-411		100		mg/L	1	1	10	04/09/14
Carbonate	CO3ALKALINI	LA-531-411	U	<1		mg/L	1	1		04/09/14
Bicarbonate	71-52-3	LA-531-411		100		mg/L	1	1		04/09/14
Hydroxyl ion	84625-61-6	LA-531-411	U	<1		mg/L	1	1		04/09/14
04/23/14										
Total Organic Carbon										
Total Organic Carbon	TOC	LA-344-406		0.317		mg/L	1	0.10	0.30	04/23/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL.
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 N - MS and/or MSD sample recovery outside control limits.
 U - Analyzed for but not detected above limiting criteria.

N - Spike Recovery is Outside Control Limits.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.
 Ignitability: <20C listed in the result field indicates sample ignited at room temperature. Maximum temperature tested for ignitability is at 100C

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140626

Sample # 140626004
 SAF# W14-004
 Sample ID B2W613

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/23/14
Total Organic Carbon										
Total Organic Carbon	TOC	LA-344-406		0.339		mg/L	1	0.10	0.30	04/23/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL.
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 N - MS and/or MSD sample recovery outside control limits.
 U - Analyzed for but not detected above limiting criteria.

N - Spike Recovery is Outside Control Limits.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.
 Ignitability: <20C listed in the result field indicates sample ignited at room temperature. Maximum temperature tested for ignitability is at 100C

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140626

Sample # 140626005
 SAF# W14-004
 Sample ID B2W614

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/28/14
Total Organic Carbon										
Total Organic Carbon	TOC	LA-344-406	B	0.262		mg/L	1	0.10	0.30	04/28/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL.
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 N - MS and/or MSD sample recovery outside control limits.
 U - Analyzed for but not detected above limiting criteria.

N - Spike Recovery is Outside Control Limits.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.
 Ignitability: <20C listed in the result field indicates sample ignited at room temperature. Maximum temperature tested for ignitability is at 100C

WSCF Analytical Results Report

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140626

Sample # 140626006
 SAF# W14-004
 Sample ID B2W615

Matrix WATER
 Sampled 04/07/14
 Received 04/07/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/28/14
Total Organic Carbon										
Total Organic Carbon	TOC	LA-344-406	B	0.287		mg/L	1	0.10	0.30	04/28/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
 + - Indicates more than nine qualifier

B - Analyte < the RDL but >= the IDL/MDL.
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 N - MS and/or MSD sample recovery outside control limits.
 U - Analyzed for but not detected above limiting criteria.

N - Spike Recovery is Outside Control Limits.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.
 Ignitability: <20C listed in the result field indicates sample ignited at room temperature. Maximum temperature tested for ignitability is at 100C

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Analytical Batch 231237 (QC Batch: 231237) Test Anions by Ion Chromatography (Water)
 Associated Samples 140626001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #108494								
Fluoride	16984-48-8		<0.025	ug/mL					U	04/07/14
Chloride	16887-00-6		<0.060	ug/mL					U	04/07/14
Nitrite-N	NO2-N		<0.020	ug/mL					U	04/07/14
Nitrate-N	NO3-N		<0.020	ug/mL					U	04/07/14
Sulfate	14808-79-8		<0.11	ug/mL					U	04/07/14
LCS		QC Sample #108495								
Fluoride	16984-48-8		0.903	ug/mL	91.2	90 - 110				04/07/14
Chloride	16887-00-6		1.90	ug/mL	96	90 - 110				04/07/14
Nitrite-N	NO2-N		1.04	ug/mL	106.3	90 - 110				04/07/14
Nitrate-N	NO3-N		0.900	ug/mL	101.6	90 - 110				04/07/14
Sulfate	14808-79-8		3.83	ug/mL	97.7	90 - 110				04/07/14
MS		QC Sample #108496								
		Original 140629001								
Fluoride	16984-48-8		0.948	ug/mL	94.8	80 - 120			D	04/07/14
Chloride	16887-00-6		2.35	ug/mL	117.6	80 - 120			DX	04/07/14
Nitrite-N	NO2-N		0.903	ug/mL	91.4	80 - 120			D	04/07/14
Nitrate-N	NO3-N		1.08	ug/mL	121	80 - 120			DX	04/07/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Sulfate	14808-79-8		5.32	ug/mL	134.4	80 - 120			DX	04/07/14
MSD			QC Sample #108497							
			Original	140629001				Paired	108496	
Fluoride	16984-48-8		0.805	ug/mL	80.5	80 - 120	13.20	20	D	04/07/14
Chloride	16887-00-6		2.43	ug/mL	121.6	80 - 120	0.40	20	DX	04/07/14
Nitrite-N	NO2-N		0.915	ug/mL	92.6	80 - 120	1.40	20	D	04/07/14
Nitrate-N	NO3-N		1.04	ug/mL	115.8	80 - 120	0.30	20	DX	04/07/14
Sulfate	14808-79-8		5.28	ug/mL	133.2	80 - 120	0.10	20	DX	04/07/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140626

Analytical Batch 231437 (QC Batch: 231437) Test Total Alkalinity as mg/L CaCO₃ (Water)
 Associated Samples 140626003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
LCS		QC Sample #108614								
Total Alkalinity as CaCO ₃	ALKALINITY	95		mg/L	94.8	80 - 120				04/09/14
DUP		QC Sample #108615								
		Original 140615002								
Total Alkalinity as CaCO ₃	ALKALINITY	67		mg/L			2.90	20		04/09/14
LCS		QC Sample #108616								
Total Alkalinity as CaCO ₃	ALKALINITY	97		mg/L	96.9	80 - 120				04/09/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140626

Analytical Batch 231735 (QC Batch: 231268) Test TC99 by Liquid Scintillation
 Associated Samples 140626007

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
Technetium-99 LCS	14133-76-7		-1.1	pCi/L					U	04/11/14
Technetium-99 DUP	14133-76-7		270	pCi/L	102.7	80 - 120				04/11/14
Technetium-99 MS	14133-76-7		60	pCi/L			16.30	20		04/11/14
Technetium-99	14133-76-7		1100	pCi/L	103.8	75 - 125				04/11/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Analytical Batch 232244 (QC Batch: 231244) Test ICP-6010 - All possible metals
 Associated Samples 140626002, 140626003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #108543								
Iron	7439-89-6	<40		ug/L					U	04/23/14
Magnesium	7439-95-4	<60		ug/L					U	04/23/14
Manganese	7439-96-5	<4.0		ug/L					U	04/23/14
Nickel	7440-02-0	<10		ug/L					U	04/23/14
Potassium	7440-09-7	<250		ug/L					U	04/23/14
Silver	7440-22-4	<5.0		ug/L					U	04/23/14
Sodium	7440-23-5	<100		ug/L					U	04/23/14
Antimony	7440-36-0	<20		ug/L					U	04/23/14
Barium	7440-39-3	<4.0		ug/L					U	04/23/14
Cadmium	7440-43-9	<4.0		ug/L					U	04/23/14
Chromium	7440-47-3	<5.0		ug/L					U	04/23/14
Cobalt	7440-48-4	<4.0		ug/L					U	04/23/14
Copper	7440-50-8	<4.0		ug/L					U	04/23/14
Vanadium	7440-62-2	<5.0		ug/L					U	04/23/14
Zinc	7440-66-6	<5.0		ug/L					U	04/23/14
Calcium	7440-70-2	<50		ug/L					U	04/23/14
Strontium	7440-24-6	<8.0		ug/L					U	04/23/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group #

WSCF140626

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Arsenic	7440-38-2		<25	ug/L					U	04/23/14
Beryllium	7440-41-7		<2.0	ug/L					U	04/23/14
LCS			QC Sample #108545							
Iron	7439-89-6		1010	ug/L	101	80 - 120				04/23/14
Magnesium	7439-95-4		10100	ug/L	100.6	80 - 120				04/23/14
Manganese	7439-96-5		994	ug/L	99.4	80 - 120				04/23/14
Nickel	7440-02-0		976	ug/L	97.6	80 - 120				04/23/14
Potassium	7440-09-7		9950	ug/L	99.5	80 - 120				04/23/14
Silver	7440-22-4		971	ug/L	97.1	80 - 120				04/23/14
Sodium	7440-23-5		10000	ug/L	100.2	80 - 120				04/23/14
Antimony	7440-36-0		974	ug/L	97.4	80 - 120				04/23/14
Barium	7440-39-3		989	ug/L	98.9	80 - 120				04/23/14
Cadmium	7440-43-9		967	ug/L	96.7	80 - 120				04/23/14
Chromium	7440-47-3		973	ug/L	97.3	80 - 120				04/23/14
Cobalt	7440-48-4		974	ug/L	97.4	80 - 120				04/23/14
Copper	7440-50-8		974	ug/L	97.4	80 - 120				04/23/14
Vanadium	7440-62-2		968	ug/L	96.8	80 - 120				04/23/14
Zinc	7440-66-6		971	ug/L	97.1	80 - 120				04/23/14
Calcium	7440-70-2		20200	ug/L	101.1	80 - 120				04/23/14
Strontium	7440-24-6		1010	ug/L	101.4	80 - 120				04/23/14
Arsenic	7440-38-2		987	ug/L	98.7	80 - 120				04/23/14
Beryllium	7440-41-7		972	ug/L	97.2	80 - 120				04/23/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MS		QC Sample #108546								
		Original 140615015								
Iron	7439-89-6	1030		ug/L	102.8	75 - 125				04/23/14
Magnesium	7439-95-4	8610		ug/L	86.1	75 - 125				04/23/14
Manganese	7439-96-5	1000		ug/L	100.4	75 - 125				04/23/14
Nickel	7440-02-0	983		ug/L	98.3	75 - 125				04/23/14
Potassium	7440-09-7	10700		ug/L	107.2	75 - 125				04/23/14
Silver	7440-22-4	1030		ug/L	103	75 - 125				04/23/14
Sodium	7440-23-5	9270		ug/L	92.7	75 - 125				04/23/14
Antimony	7440-36-0	1030		ug/L	102.8	75 - 125				04/23/14
Barium	7440-39-3	987		ug/L	98.7	75 - 125				04/23/14
Cadmium	7440-43-9	1020		ug/L	101.5	75 - 125				04/23/14
Chromium	7440-47-3	998		ug/L	99.8	75 - 125				04/23/14
Cobalt	7440-48-4	990		ug/L	99	75 - 125				04/23/14
Copper	7440-50-8	1030		ug/L	102.7	75 - 125				04/23/14
Vanadium	7440-62-2	1000		ug/L	100.2	75 - 125				04/23/14
Zinc	7440-66-6	984		ug/L	98.4	75 - 125				04/23/14
Calcium	7440-70-2	15500		ug/L	77.6	75 - 125			X	04/23/14
Strontium	7440-24-6	995		ug/L	99.5	75 - 125				04/23/14
Arsenic	7440-38-2	1050		ug/L	104.6	75 - 125				04/23/14
Beryllium	7440-41-7	1000		ug/L	100.2	75 - 125				04/23/14
MSD		QC Sample #108547								
		Original 140615015								
		Paired 108546								
Iron	7439-89-6	1010		ug/L	100.9	75 - 125	1.90	20		04/23/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Magnesium	7439-95-4		8160	ug/L	81.6	75 - 125	1.10	20		04/23/14
Manganese	7439-96-5		996	ug/L	99.6	75 - 125	0.80	20		04/23/14
Nickel	7440-02-0		975	ug/L	97.5	75 - 125	0.90	20		04/23/14
Potassium	7440-09-7		10300	ug/L	102.9	75 - 125	2.10	20		04/23/14
Silver	7440-22-4		1030	ug/L	103	75 - 125	0.00	20		04/23/14
Sodium	7440-23-5		9090	ug/L	90.9	75 - 125	0.60	20		04/23/14
Antimony	7440-36-0		1030	ug/L	102.9	75 - 125	0.10	20		04/23/14
Barium	7440-39-3		971	ug/L	97.1	75 - 125	1.50	20		04/23/14
Cadmium	7440-43-9		1010	ug/L	100.5	75 - 125	1.00	20		04/23/14
Chromium	7440-47-3		988	ug/L	98.8	75 - 125	1.00	20		04/23/14
Cobalt	7440-48-4		986	ug/L	98.6	75 - 125	0.40	20		04/23/14
Copper	7440-50-8		1020	ug/L	102.1	75 - 125	0.60	20		04/23/14
Vanadium	7440-62-2		989	ug/L	98.9	75 - 125	1.30	20		04/23/14
Zinc	7440-66-6		971	ug/L	97.1	75 - 125	1.30	20		04/23/14
Calcium	7440-70-2		14300	ug/L	71.7	75 - 125	1.00	20	X	04/23/14
Strontium	7440-24-6		982	ug/L	98.2	75 - 125	0.90	20		04/23/14
Arsenic	7440-38-2		1040	ug/L	103.7	75 - 125	0.80	20		04/23/14
Beryllium	7440-41-7		994	ug/L	99.4	75 - 125	0.90	20		04/23/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140626

Analytical Batch 232348 (QC Batch: 232348) Test Total Organic Carbon
 Associated Samples 140626003, 140626004

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #109436								
Total Organic Carbon	TOC		<0.045	mg/L					U	04/23/14
LCS		QC Sample #109437								
Total Organic Carbon	TOC		2.10	mg/L	105.1	80 - 120				04/23/14
MS		QC Sample #109438								
		Original 140626003								
Total Organic Carbon	TOC	0.317	2.11	mg/L	105.4	75 - 125				04/23/14
MSD		QC Sample #109439								
		Original 140626003								
Total Organic Carbon	TOC	0.317	2.06	mg/L	103.1	75 - 125	1.90	20	Paired 109438	04/23/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Analytical Batch 232362 (QC Batch: 232361) Test Total Organic Halides
 Associated Samples 140626006

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
			QC Sample #109481							
Total Organic Halides	59473-04-0		<5.0	ug/L					U	04/15/14
LCS										
			QC Sample #109482							
Total Organic Halides	59473-04-0		404	mg/L	101	80 - 120				04/15/14
MS										
			QC Sample #109488							
			Original 140626006							
Total Organic Halides	59473-04-0	13.6	43.4	ug/L	108.6	75 - 125				04/15/14
MSD										
			QC Sample #109489							
			Original 140626006							
			Paired 109488							
Total Organic Halides	59473-04-0	13.6	37.9	ug/L	94.8	75 - 125	10.20	20		04/15/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Analytical Batch 232365 (QC Batch: 232363) Test Total Organic Halides
 Associated Samples 140626003, 140626004, 140626005

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
			QC Sample #109490							
Total Organic Halides	59473-04-0		<5.0	ug/L					U	04/15/14
LCS										
			QC Sample #109491							
Total Organic Halides	59473-04-0		389	mg/L	97.3	80 - 120				04/15/14
MS										
			QC Sample #109495							
			Original 140623006							
Total Organic Halides	59473-04-0		41.5	ug/L	103.8	75 - 125				04/15/14
MSD										
			QC Sample #109496							
			Original 140623006							
			Paired 109495							
Total Organic Halides	59473-04-0		39.0	ug/L	97.6	75 - 125	5.20	20		04/15/14
* - QC result out of range				n/a - Not Applicable						

Quality Control Report

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140626

Analytical Batch 232550 (QC Batch: 232550) Test Total Organic Carbon
 Associated Samples 140626005, 140626006

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
			QC Sample #109644							
Total Organic Carbon	TOC		<0.045	mg/L					U	04/28/14
LCS										
			QC Sample #109645							
Total Organic Carbon	TOC		2.17	mg/L	108.5	80 - 120				04/28/14
MS										
			QC Sample #109646							
			Original 140626005							
Total Organic Carbon	TOC	0.262	2.17	mg/L	108.3	75 - 125				04/28/14
MSD										
			QC Sample #109647							
			Original 140626005							
			Paired 109646							
Total Organic Carbon	TOC	0.262	2.14	mg/L	107.1	75 - 125	1.00	20		04/28/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140626

Analytical Batch 232561 (QC Batch: 232555) Test 3E-2008 ICP-MS 3 Elements
 Associated Samples 140626007

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
Uranium	7440-61-1		<0.050	ug/L					U	05/05/14
LCS										
Uranium	7440-61-1		35.5	ug/L	88.8	85 - 115				05/05/14
MS										
Uranium	7440-61-1		35.9	ug/L	89.7	70 - 130				05/05/14
MSD										
Uranium	7440-61-1		32.1	ug/L	80.1	70 - 130	10.20	20	Paired 109663	05/05/14

* - QC result out of range

n/a - Not Applicable

Analytical Comment Report

Attention: Scot Fitzgerald

Group #

WSCF140626

Quality Control Comments

Department Inorganic

108496	B2W5K1(140629001MS)
Analyte	Chloride - Anions by Ion Chromatography (Water)
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.
Analyte	Nitrate-N - Anions by Ion Chromatography (Water)
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.
Analyte	Sulfate - Anions by Ion Chromatography (Water)
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.
108497	B2W5K1(140629001MSD)
Analyte	Chloride - Anions by Ion Chromatography (Water)
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.
Analyte	Nitrate-N - Anions by Ion Chromatography (Water)
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.
Analyte	Sulfate - Anions by Ion Chromatography (Water)
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.
108546	B2W5L4(140615015MS)
Analyte	Calcium - ICP-6010 - All possible metals
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.
108547	B2W5L4(140615015MSD)
Analyte	Calcium - ICP-6010 - All possible metals
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.

ATTACHMENT4

SAMPLE RECEIPT

Consisting of 6 pages
Including cover page

Sample Receipt

Waste Sampling and Characterization Facility
P.O. Box 650 S3-30, Richland WA 99352
Phone: (509) 373-7005/FAX: (509) 372-0456

ACKNOWLEDGEMENT OF SAMPLES RECEIVED**WSCF Laboratory**

PO Box 650 S3-30
 Richland, WA 99352

ATTN: Scot Fitzgerald

Customer Code: CHPRC
CA CN: 401647
Work Order #: 140626
Customer Work ID: W14-004-061
Due Date: 05/08/2014 **(R031)**

The following samples were received from you on 4/7/2014 12:10:00 PM. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact WSCF Client Services. Thank you for using Waste Sampling and Characterization Facility.

Sample #	Sample ID	Matrix	Collected	Received
140626001	B2W5J7	WATER	4/7/2014 11:35	4/7/2014 12:10
Procedure		Compound List		
Anions by Ion Chromatography (Water)		F,Cl,NO2,NO3,SO4		
Sample #	Sample ID	Matrix	Collected	Received
140626002	B2W5J8	WATER	4/7/2014 11:35	4/7/2014 12:10
Procedure		Compound List		
ICP-6010 - All possible metals		6010 ICP Common + GW03		
Sample #	Sample ID	Matrix	Collected	Received
140626003	B2W5J6	WATER	4/7/2014 11:35	4/7/2014 12:10
Procedure		Compound List		
ICP-6010 - All possible metals		6010 ICP Common + GW03		
Total Alkalinity as mg/L CaCO3 (Water)		Alkalinity,Carbonate,Bicarbonate,Hydroxyl Ion		
Total Organic Carbon		TOC		
Total Organic Halides		TOX		
Sample #	Sample ID	Matrix	Collected	Received
140626004	B2W613	WATER	4/7/2014 11:35	4/7/2014 12:10
Procedure		Compound List		
Total Organic Carbon		TOC		
Total Organic Halides		TOX		
Sample #	Sample ID	Matrix	Collected	Received
140626005	B2W614	WATER	4/7/2014 11:35	4/7/2014 12:10
Procedure		Compound List		
Total Organic Carbon		TOC		
Total Organic Halides		TOX		
Sample #	Sample ID	Matrix	Collected	Received
140626006	B2W615	WATER	4/7/2014 11:35	4/7/2014 12:10
Procedure		Compound List		
Total Organic Carbon		TOC		
Total Organic Halides		TOX		
Sample #	Sample ID	Matrix	Collected	Received
140626007	B2W7Y1 (S14-004)	WATER	4/7/2014 11:35	4/7/2014 12:10
Procedure		Compound List		

MAY 6, 2014

Sample Receipt

Waste Sampling and Characterization Facility
P.O. Box 650 S3-30, Richland WA 99352
Phone: (509) 373-7005/FAX: (509) 372-0456

3E-2008 ICP-MS 3 Elements
TC99 by Liquid Scintillation
Tritium by LSC

U
Tc-99
H3

Sample Receipt

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #
W14-004-061
Page 1 of 1

Collector	Jason Aguilera	Contact/Requester	Karen Waters-Fusted	Telephone No.	509-376-4950
SAF No.	W14-004	Sampling Origin	Hanford Site	Package Order/Charge Code	300071ES20
Project Title	RCRA, APRIL 2014	Logbook No.	HNF-N-506 UM / §2	Ice Check No.	N/A
Shipped To (Lab)	Waste Sampling & Characterization	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	RCRA	Priority:	31 Days	Offsite Property No.	N/A
POSSIBLE SAMPLE HAZARDS/REMARKS *** Contact Radioactive Material at concentrations that may or maynot be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 438.1.			SPECIAL INSTRUCTIONS Site Wide Generator Knowledge Information Form applies The CACN for analytical work at WSCF is 401647.		
Sample No	Filter * N	Date	Time	Na/Type Container	Sample Analysis
BZWSJ7	W	4-7-14	1135	1x500-mL P	300.0 ANIONS_IC_COMMON
					48 Hours
					Preservative Cool-4C

Chain of Custody

Relinquished By	Print	Sign	Date/Time	Received By	Sign	Date/Time	Matrix *
Relinquished By			APR 07 2014 12:10	Received By		APR 07 2014 12:10	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By				Received By			DS = Drum Solids DL = Drum Liquids T = Tissue WT = Wipe L = Liquid V = Vegetation X = Other
Relinquished By				Received By			
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per the procedures, used in process)							

PRINTED ON 3/4/2014

A 6004-842 (REV 2)

Sample Receipt

CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #
W14-004-060
Page 1 of 1

Collector: Juan Aguilar	Contact/Requester: Karen Waters-Husted	Telephone No.: 509-376-4850	
SAF No.: W14-004	Sampling Origin: Hanford Site	Purchase Order/Charge Code: 300071ESS20	
Project Title: RCRA, APRIL 2014	Logbook No.: HNF-N-506 G1 / 82	Ice Chest No.: N/A	
Shipped To (Lab): Waste Sampling & Characterization	Method of Shipment: GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.: N/A	
Protocol: RCRA	Priority: 31 Days	Offsite Property No.: N/A	
POSSIBLE SAMPLE HAZARDS/REMARKS			
*** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 438.1.			
SPECIAL INSTRUCTIONS		Hold Time	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Site Wide Generator Knowledge Information from applies			
The CACN for analytical work at WSCF is 401647.			

Sample No.	Filter	*	Date	Time	Net/Type Container	Sample Analysis	Sample Analysis	Hold Time	Preservative
B2W6-14	N	W	4-7-14	1135	1x1-L aG3*	5020_TOX: COMMON	5020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool-4C
B2W6-14	N	W			1x250-mL EG	5060_TOX: COMMON	5060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool-4C
B2W5-8	Y	W			1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 03	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 03	0 Months	HNO3 to pH <2
B2W6-5	N	W			1x1-L aG3*	5020_TOX: COMMON	5020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool-4C
B2W6-5	N	W			1x250-mL EG	5060_TOX: COMMON	5060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool-4C
B2W6-13	N	W			1x1-L aG3*	5020_TOX: COMMON	5020_TOX: COMMON	28 Days	H2SO4 to pH <2/Cool-4C
B2W6-13	N	W			1x250-mL EG	5060_TOX: COMMON	5060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool-4C
B2W5-6	N	W			1x500-mL G/P	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 03	6010_METALS_ICP: COMMON; 6010_METALS_ICP: GW 03	0 Months	HNO3 to pH <2
B2W5-6	N	W			1x250-mL G/P	5020_TOX: COMMON	5020_TOX: COMMON	14 Days	Cool-4C
B2W5-6	N	W			1x1-L aG3*	5020_TOX: COMMON	5020_TOX: COMMON	28 Days	I IES04 to pH <2/Cool-4C
B2W5-6	N	W	4-7-14	1135	1x250-mL EG	5060_TOX: COMMON	5060_TOX: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool-4C

Relinquished By: Juan Aguilar	Print	Sign	Date/Time	Received By: K Waters	Print	Sign	Date/Time
Relinquished By: <i>[Signature]</i>			APR 07 2014 12:00	Received By: <i>[Signature]</i>			APR 07 2014 12:00
Relinquished By: _____			Date/Time	Received By: _____			Date/Time
Relinquished By: _____			Date/Time	Received By: _____			Date/Time
FINAL SAMPLE DISPOSITION				Disposal Method (e.g., Return to customer, per the procedure, used in process)			
PRINTED ON 3/4/2014				DISPOSED BY: _____			

A 6004 942 (REV 2)

Sample Receipt

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #
S14-004-246
Page 1 of 1

Collector	Juan Aguilar	Contact/Requester	Karen Walters-Husted	Telephone No.	509-376-4650
SAF No.	S14-004	Sampling Origin	Hanford Site	Purchase Order/Charge Code	300071ESS20
Project Title	SURV, APRIL 2014	Logbook No.	HNF-N-306 61 / 82	Ice Check No.	N/A
Shipped To (Lab)	Waste Sampling & Characterization	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	SURV	Priority:	31 Days	Offsite Property No.	N/A
POSSIBLE SAMPLE HAZARDS/REMARKS			SPECIAL INSTRUCTIONS		
** ** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 438.1.			Hold Time Site Wide Generator Knowledge Information Form, apply. The CACH for analytical work at WSCF is 401647.		
Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>					

Sample No.	Filter	Date	Time	No./Type Container	Sample Analysis	Holding Time	Preservative
B2W7T1 7	N	4-7-14	1135	1x500-mL G/P	200.8_METALS_ICPMS: Uranium (1)	6 Months	HNO3 to pH <2
B2W7T1	N	4-7-14	1135	1x1-L G/P	TC99_3MDSK_LSC: COMMON	6 Months	HCl to pH <2
B2W7T1	N	4-7-14	1135	1x250-mL G	TRITIUM_EIE_LSC: COMMON	6 Months	None

Chain of Custody

Reinquisitioned By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
Juan Aguilar			APR 07 2014 12:10	KARISAR			12:10	S = Soil SD = Sediment SL = Sludge W = Water A = Air DS = Drum Solids DL = Drum Liquids T = Tissue W1 = Wipe L = Liquid Y = Yeast X = Other
Reinquisitioned By				Received By				
Reinquisitioned By				Received By				
Reinquisitioned By				Received By				
FINAL SAMPLE DISPOSITION				Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Date/Time
PRINTED O 3/9/2014				DISPOSED BY				A-6004-942 (REV 2)