

May 14, 2014

WSCF Laboratory

PO Box 650 S3-30
Richland, WA 99352



May 14, 2014

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

Dear Scot Fitzgerald,

FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF140715

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 WSCF140715

- * 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

May 14, 2014

ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF Number Cross Reference

Group # WSCF140715
Data Deliverable Date 05/22/14

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
X14-028	B2W6C9	140715001	WATER	04/21/14	04/21/14
X14-028	B2W6C7	140715002	WATER	04/21/14	04/21/14
X14-028	B2W6K9	140715003	WATER	04/21/14	04/21/14
X14-028	B2W6L1	140715004	WATER	04/21/14	04/21/14
X14-028	B2W6C8	140715005	WATER	04/21/14	04/21/14
X14-028	B2W6C6	140715006	WATER	04/21/14	04/21/14
X14-028	B2W6K8	140715007	WATER	04/21/14	04/21/14
X14-028	B2W6L0	140715008	WATER	04/21/14	04/21/14

ATTACHMENT 2

NARRATIVE

Consisting of 3 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

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

- All 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):

- Boron – Matrix Spike and/or Matrix Spike Duplicate recoveries are outside established laboratory limits. Affected sample results in this batch were “N” flagged.
- Chromium – 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.

Radiochemistry Comments

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

Tritium:

- 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.

May 14, 2014

ATTACHMENT 3

ANALYTICAL RESULTS

Consisting of 31 pages
Including cover page

May 14, 2014

WSCF ANALYTICAL RESULTS REPORT

For

CH2M Hill Plateau Remediation

PO Box 1600
Richland, WA 99352

Attention: Scot Fitzgerald

Contract # MOA-FH-CHPRC-2008
Group # WSCF140715
Report Date May 14, 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 # WSCF140715

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
232153	232153	1	BLANK	109265	BLANK		Hexavalent chromium Discrete Analyzer
232153	232153	3	LCS	109267	LCS		Hexavalent chromium Discrete Analyzer
232153	232153	4	DUP	109268	B2W6L8(140719004DUP)	140719004	Hexavalent chromium Discrete Analyzer
232153	232153	5	MS	109269	B2W6L8(140719004MS)	140719004	Hexavalent chromium Discrete Analyzer
232153	232153	7	SAMPLE	140715001	B2W6C9		Hexavalent chromium Discrete Analyzer
232153	232153	8	SAMPLE	140715002	B2W6C7		Hexavalent chromium Discrete Analyzer
232153	232153	9	SAMPLE	140715003	B2W6K9		Hexavalent chromium Discrete Analyzer
232153	232153	10	SAMPLE	140715004	B2W6L1		Hexavalent chromium Discrete Analyzer
232163	232784	5	BLANK	109326	BLANK		ICP-6010 - All possible metals
232163	232784	7	LCS	109328	LCS		ICP-6010 - All possible metals
232163	232784	9	MS	109329	B2V2Y7(140723001MS)	140723001	ICP-6010 - All possible metals
232163	232784	10	MSD	109330	B2V2Y7(140723001MSD)	140723001	ICP-6010 - All possible metals
232163	232784	12	SAMPLE	140715005	B2W6C8		ICP-6010 - All possible metals
232163	232784	13	SAMPLE	140715006	B2W6C6		ICP-6010 - All possible metals
232163	232784	14	SAMPLE	140715007	B2W6K8		ICP-6010 - All possible metals
232163	232784	15	SAMPLE	140715008	B2W6L0		ICP-6010 - All possible metals
233080	233274	4	BLANK	110017	BLANK		ICP-2008 MS All possible metal
233080	233274	5	LCS	110018	LCS		ICP-2008 MS All possible metal
233080	233274	7	MS	110019	B2W7D9(140710007MS)	140710007	ICP-2008 MS All possible metal
233080	233274	8	MSD	110020	B2W7D9(140710007MSD)	140710007	ICP-2008 MS All possible metal
233080	233274	22	SAMPLE	140715005	B2W6C8		ICP-2008 MS All possible metal
233080	233274	23	SAMPLE	140715006	B2W6C6		ICP-2008 MS All possible metal
233080	233274	24	SAMPLE	140715007	B2W6K8		ICP-2008 MS All possible metal

May 14, 2014

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF140715

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
233080	233274	25	SAMPLE	140715008	B2W6L0		ICP-2008 MS All possible metal

Batch QC List

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140715

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
232060	232256	1	BLANK	109212	BLANK		Tritium by LSC
232060	232256	2	LCS	109213	LCS		Tritium by LSC
232060	232256	4	DUP	109214	B2W887(140697008DUP)	140697008	Tritium by LSC
232060	232256	5	MSPK	109215	B2W887(140697008MSP)		Tritium by LSC
232060	232256	19	SAMPLE	140715006	B2W6C6		Tritium by LSC
232060	232256	20	SAMPLE	140715007	B2W6K8		Tritium by LSC

Method Reference

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

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-265-403	Hexavalent Chromium Analysis		
	EPA SW-846	7196A	Hexavalent Chromium
	HEIS	7196_CR6	Hexavalent Chromium
LA-505-411	Elemental Analysis by ICP Atomic Emission Spectroscopy (ICP AES)		
	EPA SW-846	6010C	Inductively Coupled Plasma-Atomic Emmission Spectrometry
	HEIS	6010_METALS_ICP	Inductively Coupled Plasma-Atomic Emmission 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.

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 # WSCF140715

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-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>

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715001
 SAF# X14-028
 Sample ID B2W6C9

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
04/21/14										
Hexavalent chromium Discrete Analyzer										
Hexavalent chromium	18540-29-9	LA-265-403		0.0358		mg/L	1	0.0020	0.0050	04/21/14

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.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715002
 SAF# X14-028
 Sample ID B2W6C7

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/21/14
Hexavalent chromium Discrete Analyzer										
Hexavalent chromium	18540-29-9	LA-265-403		0.0353		mg/L	1	0.0020	0.0050	04/21/14

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.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715003
 SAF# X14-028
 Sample ID B2W6K9

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/21/14
Hexavalent chromium Discrete Analyzer										
Hexavalent chromium	18540-29-9	LA-265-403		0.0387		mg/L	1	0.0020	0.0050	04/21/14

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.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715004
 SAF# X14-028
 Sample ID B2W6L1

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/21/14
Hexavalent chromium Discrete Analyzer										
Hexavalent chromium	18540-29-9	LA-265-403		0.0394		mg/L	1	0.0020	0.0050	04/21/14

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.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715005
 SAF# X14-028
 Sample ID B2W6C8

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPAES Prep (W)										05/05/14
ICP-6010 - All possible metals										
Iron	7439-89-6	LA-505-411	U	<40		ug/L	1	40	50	05/05/14
Magnesium	7439-95-4	LA-505-411		9980		ug/L	1	60	750	05/05/14
Potassium	7440-09-7	LA-505-411		5030		ug/L	1	250	4000	05/05/14
Sodium	7440-23-5	LA-505-411		11100		ug/L	1	100	500	05/05/14
Calcium	7440-70-2	LA-505-411		43100		ug/L	1	50	1000	05/05/14
ICPMS Prep (W)										05/13/14
ICP-2008 MS All possible metal										
Aluminum	7429-90-5	LA-505-412	UD	<20		ug/L	2	20	100	05/13/14
Manganese	7439-96-5	LA-505-412	BD	0.586		ug/L	2	0.20	2.0	05/13/14
Nickel	7440-02-0	LA-505-412	BD	1.02		ug/L	2	0.20	2.0	05/13/14
Silver	7440-22-4	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Antimony	7440-36-0	LA-505-412	UD	<0.60		ug/L	2	0.60	6.0	05/13/14
Barium	7440-39-3	LA-505-412	D	17.2		ug/L	2	0.40	4.0	05/13/14
Beryllium	7440-41-7	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/13/14
Cadmium	7440-43-9	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Chromium	7440-47-3	LA-505-412	D	37.0		ug/L	2	0.20	2.0	05/13/14
Cobalt	7440-48-4	LA-505-412	BD	0.198		ug/L	2	0.10	0.50	05/13/14

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.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715005
 SAF# X14-028
 Sample ID B2W6C8

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Copper	7440-50-8	LA-505-412	D	4.05		ug/L	2	0.20	2.0	05/13/14
Zinc	7440-66-6	LA-505-412	UD	<4.0		ug/L	2	4.0	20	05/13/14
Lead	7439-92-1	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Molybdenum	7439-98-7	LA-505-412	D	2.75		ug/L	2	0.10	1.0	05/13/14
Strontium	7440-24-6	LA-505-412	D	176		ug/L	2	0.40	2.0	05/13/14
Thallium	7440-28-0	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Tin	7440-31-5	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Uranium	7440-61-1	LA-505-412	D	1.51		ug/L	2	0.10	0.50	05/13/14
Arsenic	7440-38-2	LA-505-412	BD	2.55		ug/L	2	0.40	4.0	05/13/14
Selenium	7782-49-2	LA-505-412	UD	<2.0		ug/L	2	2.0	20	05/13/14
Thorium	7440-29-1	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/13/14
Boron	7440-42-8	LA-505-412	BDN	9.98		ug/L	2	4.0	10	05/13/14

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

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 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.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715006
 SAF# X14-028
 Sample ID B2W6C6

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPAES Prep (W)										05/05/14
ICP-6010 - All possible metals										
Iron	7439-89-6	LA-505-411	U	<40		ug/L	1	40	50	05/05/14
Magnesium	7439-95-4	LA-505-411		10500		ug/L	1	60	750	05/05/14
Potassium	7440-09-7	LA-505-411		5250		ug/L	1	250	4000	05/05/14
Sodium	7440-23-5	LA-505-411		11600		ug/L	1	100	500	05/05/14
Calcium	7440-70-2	LA-505-411		45300		ug/L	1	50	1000	05/05/14
ICPMS Prep (W)										05/13/14
ICP-2008 MS All possible metal										
Aluminum	7429-90-5	LA-505-412	UD	<20		ug/L	2	20	100	05/13/14
Manganese	7439-96-5	LA-505-412	BD	0.266		ug/L	2	0.20	2.0	05/13/14
Nickel	7440-02-0	LA-505-412	BD	1.13		ug/L	2	0.20	2.0	05/13/14
Silver	7440-22-4	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Antimony	7440-36-0	LA-505-412	UD	<0.60		ug/L	2	0.60	6.0	05/13/14
Barium	7440-39-3	LA-505-412	D	16.0		ug/L	2	0.40	4.0	05/13/14
Beryllium	7440-41-7	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/13/14
Cadmium	7440-43-9	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Chromium	7440-47-3	LA-505-412	D	36.4		ug/L	2	0.20	2.0	05/13/14
Cobalt	7440-48-4	LA-505-412	UD	<0.10		ug/L	2	0.10	0.50	05/13/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 DF = Dilution Factor
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 C - Analyte was found in the Associated Blank. (Inorganic)
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 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.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715006
 SAF# X14-028
 Sample ID B2W6C6

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Copper	7440-50-8	LA-505-412	D	13.0		ug/L	2	0.20	2.0	05/13/14
Zinc	7440-66-6	LA-505-412	UD	<4.0		ug/L	2	4.0	20	05/13/14
Lead	7439-92-1	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Molybdenum	7439-98-7	LA-505-412	D	2.56		ug/L	2	0.10	1.0	05/13/14
Strontium	7440-24-6	LA-505-412	D	162		ug/L	2	0.40	2.0	05/13/14
Thallium	7440-28-0	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Tin	7440-31-5	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Uranium	7440-61-1	LA-505-412	D	1.41		ug/L	2	0.10	0.50	05/13/14
Arsenic	7440-38-2	LA-505-412	BD	2.22		ug/L	2	0.40	4.0	05/13/14
Selenium	7782-49-2	LA-505-412	UD	<2.0		ug/L	2	2.0	20	05/13/14
Thorium	7440-29-1	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/13/14
Boron	7440-42-8	LA-505-412	DN	12.3		ug/L	2	4.0	10	05/13/14

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.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715007
 SAF# X14-028
 Sample ID B2W6K8

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPAES Prep (W)										05/05/14
ICP-6010 - All possible metals										
Iron	7439-89-6	LA-505-411	U	<40		ug/L	1	40	50	05/05/14
Magnesium	7439-95-4	LA-505-411		9900		ug/L	1	60	750	05/05/14
Potassium	7440-09-7	LA-505-411		4520		ug/L	1	250	4000	05/05/14
Sodium	7440-23-5	LA-505-411		8530		ug/L	1	100	500	05/05/14
Calcium	7440-70-2	LA-505-411		38300		ug/L	1	50	1000	05/05/14
ICPMS Prep (W)										05/13/14
ICP-2008 MS All possible metal										
Aluminum	7429-90-5	LA-505-412	UD	<20		ug/L	2	20	100	05/13/14
Manganese	7439-96-5	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/13/14
Nickel	7440-02-0	LA-505-412	BD	0.258		ug/L	2	0.20	2.0	05/13/14
Silver	7440-22-4	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Antimony	7440-36-0	LA-505-412	UD	<0.60		ug/L	2	0.60	6.0	05/13/14
Barium	7440-39-3	LA-505-412	D	29.0		ug/L	2	0.40	4.0	05/13/14
Beryllium	7440-41-7	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/13/14
Cadmium	7440-43-9	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Chromium	7440-47-3	LA-505-412	D	36.7		ug/L	2	0.20	2.0	05/13/14
Cobalt	7440-48-4	LA-505-412	UD	<0.10		ug/L	2	0.10	0.50	05/13/14

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.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715007
 SAF# X14-028
 Sample ID B2W6K8

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Copper	7440-50-8	LA-505-412	BD	0.284		ug/L	2	0.20	2.0	05/13/14
Zinc	7440-66-6	LA-505-412	UD	<4.0		ug/L	2	4.0	20	05/13/14
Lead	7439-92-1	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Molybdenum	7439-98-7	LA-505-412	D	1.51		ug/L	2	0.10	1.0	05/13/14
Strontium	7440-24-6	LA-505-412	D	161		ug/L	2	0.40	2.0	05/13/14
Thallium	7440-28-0	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Tin	7440-31-5	LA-505-412	BD	0.616		ug/L	2	0.10	1.0	05/13/14
Uranium	7440-61-1	LA-505-412	D	0.954		ug/L	2	0.10	0.50	05/13/14
Arsenic	7440-38-2	LA-505-412	BD	2.14		ug/L	2	0.40	4.0	05/13/14
Selenium	7782-49-2	LA-505-412	UD	<2.0		ug/L	2	2.0	20	05/13/14
Thorium	7440-29-1	LA-505-412	BD	0.468		ug/L	2	0.20	2.0	05/13/14
Boron	7440-42-8	LA-505-412	BDN	8.93		ug/L	2	4.0	10	05/13/14

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.

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 X,Y or Z - See comment detail and/or narrative.
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 o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715008
 SAF# X14-028
 Sample ID B2W6L0

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPAES Prep (W)										05/05/14
ICP-6010 - All possible metals										
Iron	7439-89-6	LA-505-411	U	<40		ug/L	1	40	50	05/05/14
Magnesium	7439-95-4	LA-505-411		10000		ug/L	1	60	750	05/05/14
Potassium	7440-09-7	LA-505-411		4610		ug/L	1	250	4000	05/05/14
Sodium	7440-23-5	LA-505-411		8710		ug/L	1	100	500	05/05/14
Calcium	7440-70-2	LA-505-411		39000		ug/L	1	50	1000	05/05/14
ICPMS Prep (W)										05/13/14
ICP-2008 MS All possible metal										
Aluminum	7429-90-5	LA-505-412	UD	<20		ug/L	2	20	100	05/13/14
Manganese	7439-96-5	LA-505-412	BD	0.248		ug/L	2	0.20	2.0	05/13/14
Nickel	7440-02-0	LA-505-412	BD	0.284		ug/L	2	0.20	2.0	05/13/14
Silver	7440-22-4	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Antimony	7440-36-0	LA-505-412	UD	<0.60		ug/L	2	0.60	6.0	05/13/14
Barium	7440-39-3	LA-505-412	D	29.1		ug/L	2	0.40	4.0	05/13/14
Beryllium	7440-41-7	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/13/14
Cadmium	7440-43-9	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Chromium	7440-47-3	LA-505-412	D	37.5		ug/L	2	0.20	2.0	05/13/14
Cobalt	7440-48-4	LA-505-412	UD	<0.10		ug/L	2	0.10	0.50	05/13/14

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

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 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.

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Sample # 140715008
 SAF# X14-028
 Sample ID B2W6L0

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Copper	7440-50-8	LA-505-412	BD	0.282		ug/L	2	0.20	2.0	05/13/14
Zinc	7440-66-6	LA-505-412	UD	<4.0		ug/L	2	4.0	20	05/13/14
Lead	7439-92-1	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Molybdenum	7439-98-7	LA-505-412	D	1.46		ug/L	2	0.10	1.0	05/13/14
Strontium	7440-24-6	LA-505-412	D	166		ug/L	2	0.40	2.0	05/13/14
Thallium	7440-28-0	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/13/14
Tin	7440-31-5	LA-505-412	BD	0.158		ug/L	2	0.10	1.0	05/13/14
Uranium	7440-61-1	LA-505-412	D	0.984		ug/L	2	0.10	0.50	05/13/14
Arsenic	7440-38-2	LA-505-412	BD	2.37		ug/L	2	0.40	4.0	05/13/14
Selenium	7782-49-2	LA-505-412	UD	<2.0		ug/L	2	2.0	20	05/13/14
Thorium	7440-29-1	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/13/14
Boron	7440-42-8	LA-505-412	BDN	8.54		ug/L	2	4.0	10	05/13/14

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.

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140715

Sample # 140715006
 SAF# X14-028
 Sample ID B2W6C6

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Tritium by LSC EICHROM WA/LIQ PREP										04/22/14
Tritium by LSC										
Tritium	10028-17-8	LA-508-421		7400	1500	pCi/L	1	280		04/29/14

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.

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140715

Sample # 140715007
 SAF# X14-028
 Sample ID B2W6K8

Matrix WATER
 Sampled 04/21/14
 Received 04/21/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Tritium by LSC EICHROM WA/LIQ PREP										04/22/14
Tritium by LSC										
Tritium	10028-17-8	LA-508-421		7000	1500	pCi/L	1	280		04/29/14

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.

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Analytical Batch 232153 (QC Batch: 232153) Test Hexavalent chromium Discrete Analyzer
 Associated Samples 140715001, 140715002, 140715003, 140715004

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #109265								
Hexavalent chromium	18540-29-9		<0.0020	mg/L					U	04/21/14
LCS		QC Sample #109267								
Hexavalent chromium	18540-29-9		0.0525	mg/L	105	90 - 110				04/21/14
DUP		QC Sample #109268								
		Original 140719004								
Hexavalent chromium	18540-29-9		0.0111	mg/L			2.70	20		04/21/14
MS		QC Sample #109269								
		Original 140719004								
Hexavalent chromium	18540-29-9		0.0422	mg/L	105.5	85 - 115				04/21/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140715

Analytical Batch 232256 (QC Batch: 232060) Test Tritium by LSC
 Associated Samples 140715006, 140715007

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
Tritium	10028-17-8		-32	pCi/L					U	04/29/14
LCS										
Tritium	10028-17-8		3700	pCi/L	95.6	80 - 120				04/29/14
DUP										
Tritium	10028-17-8		120	pCi/L			105.60	20	* U	04/29/14
MSPK										
Tritium	10028-17-8		19000	pCi/L	93.4	75 - 125				04/29/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Analytical Batch 232784 (QC Batch: 232163) Test ICP-6010 - All possible metals
 Associated Samples 140715005, 140715006, 140715007, 140715008

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #109326								
Iron	7439-89-6	<40		ug/L					U	05/05/14
Magnesium	7439-95-4	<60		ug/L					U	05/05/14
Potassium	7440-09-7	<250		ug/L					U	05/05/14
Sodium	7440-23-5	<100		ug/L					U	05/05/14
Calcium	7440-70-2	<50		ug/L					U	05/05/14
LCS		QC Sample #109328								
Iron	7439-89-6	1100		ug/L	110.5	80 - 120				05/05/14
Magnesium	7439-95-4	9830		ug/L	98.3	80 - 120				05/05/14
Potassium	7440-09-7	10100		ug/L	100.6	80 - 120				05/05/14
Sodium	7440-23-5	9760		ug/L	97.6	80 - 120				05/05/14
Calcium	7440-70-2	19700		ug/L	98.7	80 - 120				05/05/14
MS		QC Sample #109329								
		Original 140723001								
Iron	7439-89-6	997		ug/L	99.7	75 - 125				05/05/14
Magnesium	7439-95-4	9850		ug/L	98.5	75 - 125				05/05/14
Potassium	7440-09-7	8770		ug/L	87.7	75 - 125				05/05/14
Sodium	7440-23-5	9410		ug/L	94.1	75 - 125				05/05/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Calcium MSD	7440-70-2		17300	ug/L	86.3	75 - 125			X	05/05/14
			QC Sample #109330							
			Original 140723001					Paired 109329		
Iron	7439-89-6		992	ug/L	99.2	75 - 125	0.50	20		05/05/14
Magnesium	7439-95-4		8560	ug/L	85.6	75 - 125	2.90	20		05/05/14
Potassium	7440-09-7		8420	ug/L	84.2	75 - 125	1.80	20		05/05/14
Sodium	7440-23-5		8520	ug/L	85.2	75 - 125	2.20	20		05/05/14
Calcium	7440-70-2		14700	ug/L	73.6	75 - 125	1.80	20	X	05/05/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Analytical Batch 233274 (QC Batch: 233080) Test ICP-2008 MS All possible metal
 Associated Samples 140715005, 140715006, 140715007, 140715008

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #110017								
Aluminum	7429-90-5	<10		ug/L					U	05/13/14
Manganese	7439-96-5	<0.10		ug/L					U	05/13/14
Nickel	7440-02-0	<0.10		ug/L					U	05/13/14
Silver	7440-22-4	<0.050		ug/L					U	05/13/14
Antimony	7440-36-0	<0.30		ug/L					U	05/13/14
Barium	7440-39-3	<0.20		ug/L					U	05/13/14
Beryllium	7440-41-7	<0.10		ug/L					U	05/13/14
Cadmium	7440-43-9	<0.050		ug/L					U	05/13/14
Chromium	7440-47-3	<0.10		ug/L					U	05/13/14
Cobalt	7440-48-4	<0.050		ug/L					U	05/13/14
Copper	7440-50-8	<0.10		ug/L					U	05/13/14
Zinc	7440-66-6	<2.0		ug/L					U	05/13/14
Lead	7439-92-1	<0.050		ug/L					U	05/13/14
Molybdenum	7439-98-7	<0.050		ug/L					U	05/13/14
Strontium	7440-24-6	<0.20		ug/L					U	05/13/14
Thallium	7440-28-0	<0.050		ug/L					U	05/13/14
Tin	7440-31-5	<0.050		ug/L					U	05/13/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Uranium	7440-61-1		<0.050	ug/L					U	05/13/14
Arsenic	7440-38-2		<0.20	ug/L					U	05/13/14
Selenium	7782-49-2		<1.0	ug/L					U	05/13/14
Thorium	7440-29-1		<0.10	ug/L					U	05/13/14
Boron	7440-42-8		<2.0	ug/L					U	05/13/14
LCS			QC Sample #110018							
Aluminum	7429-90-5		416	ug/L	104.1	85 - 115				05/13/14
Manganese	7439-96-5		40.9	ug/L	102.2	85 - 115				05/13/14
Nickel	7440-02-0		39.6	ug/L	99.1	85 - 115				05/13/14
Silver	7440-22-4		37.2	ug/L	92.9	85 - 115				05/13/14
Antimony	7440-36-0		39.6	ug/L	98.9	85 - 115				05/13/14
Barium	7440-39-3		38.5	ug/L	96.2	85 - 115				05/13/14
Beryllium	7440-41-7		39.6	ug/L	98.9	85 - 115				05/13/14
Cadmium	7440-43-9		38.3	ug/L	95.9	85 - 115				05/13/14
Chromium	7440-47-3		40.5	ug/L	101.3	85 - 115				05/13/14
Cobalt	7440-48-4		40.5	ug/L	101.3	85 - 115				05/13/14
Copper	7440-50-8		40.1	ug/L	100.3	85 - 115				05/13/14
Zinc	7440-66-6		41.4	ug/L	103.4	85 - 115				05/13/14
Lead	7439-92-1		36.9	ug/L	92.3	85 - 115				05/13/14
Molybdenum	7439-98-7		37.1	ug/L	92.7	85 - 115				05/13/14
Strontium	7440-24-6		394	ug/L	98.5	85 - 115				05/13/14
Thallium	7440-28-0		36.2	ug/L	90.6	85 - 115				05/13/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Tin	7440-31-5		36.7	ug/L	91.9	85 - 115				05/13/14
Uranium	7440-61-1		39.7	ug/L	99.3	85 - 115				05/13/14
Arsenic	7440-38-2		37.0	ug/L	92.5	85 - 115				05/13/14
Selenium	7782-49-2		37.3	ug/L	93.2	85 - 115				05/13/14
Thorium	7440-29-1		35.8	ug/L	89.5	85 - 115				05/13/14
Boron	7440-42-8		37.2	ug/L	92.9	85 - 115				05/13/14
MS			QC Sample #110019							
			Original 140710007							
Aluminum	7429-90-5		327	ug/L	81.7	70 - 130				05/13/14
Manganese	7439-96-5		34.1	ug/L	85.3	70 - 130				05/13/14
Nickel	7440-02-0		32.9	ug/L	82.3	70 - 130				05/13/14
Silver	7440-22-4		35.0	ug/L	87.5	70 - 130				05/13/14
Antimony	7440-36-0		36.9	ug/L	92.2	70 - 130				05/13/14
Barium	7440-39-3		29.0	ug/L	72.6	70 - 130				05/13/14
Beryllium	7440-41-7		34.7	ug/L	86.6	70 - 130				05/13/14
Cadmium	7440-43-9		34.9	ug/L	87.3	70 - 130				05/13/14
Chromium	7440-47-3		-96.6	ug/L	-241.5	70 - 130			X	05/13/14
Cobalt	7440-48-4		34.1	ug/L	85.2	70 - 130				05/13/14
Copper	7440-50-8		32.8	ug/L	82.1	70 - 130				05/13/14
Zinc	7440-66-6		32.9	ug/L	82.1	70 - 130				05/13/14
Lead	7439-92-1		33.8	ug/L	84.5	70 - 130				05/13/14
Molybdenum	7439-98-7		37.4	ug/L	93.5	70 - 130				05/13/14
Strontium	7440-24-6		296	ug/L	73.9	70 - 130				05/13/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140715

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed	
Thallium	7440-28-0		33.4	ug/L	83.6	70 - 130				05/13/14	
Tin	7440-31-5		37.5	ug/L	93.8	70 - 130				05/13/14	
Uranium	7440-61-1		38.1	ug/L	95.3	70 - 130				05/13/14	
Arsenic	7440-38-2		34.6	ug/L	86.5	70 - 130				05/13/14	
Selenium	7782-49-2		34.0	ug/L	84.9	70 - 130				05/13/14	
Thorium	7440-29-1		37.8	ug/L	94.4	70 - 130				05/13/14	
Boron	7440-42-8		26.3	ug/L	65.7	70 - 130			N	05/13/14	
MSD			QC Sample #110020								
			Original	140710007					Paired	110019	
Aluminum	7429-90-5		342	ug/L	85.6	70 - 130	4.60	20		05/13/14	
Manganese	7439-96-5		35.1	ug/L	87.8	70 - 130	2.90	20		05/13/14	
Nickel	7440-02-0		33.9	ug/L	84.6	70 - 130	2.60	20		05/13/14	
Silver	7440-22-4		34.7	ug/L	86.7	70 - 130	0.90	20		05/13/14	
Antimony	7440-36-0		36.4	ug/L	91.1	70 - 130	1.20	20		05/13/14	
Barium	7440-39-3		28.4	ug/L	71.1	70 - 130	0.80	20		05/13/14	
Beryllium	7440-41-7		35.2	ug/L	88	70 - 130	1.50	20		05/13/14	
Cadmium	7440-43-9		34.5	ug/L	86.2	70 - 130	1.20	20		05/13/14	
Chromium	7440-47-3		-78.5	ug/L	-196.2	70 - 130	2.20	20	X	05/13/14	
Cobalt	7440-48-4		35.0	ug/L	87.4	70 - 130	2.60	20		05/13/14	
Copper	7440-50-8		34.2	ug/L	85.6	70 - 130	4.20	20		05/13/14	
Zinc	7440-66-6		34.2	ug/L	85.5	70 - 130	4.00	20		05/13/14	
Lead	7439-92-1		33.6	ug/L	84.1	70 - 130	0.50	20		05/13/14	
Molybdenum	7439-98-7		36.5	ug/L	91.3	70 - 130	2.30	20		05/13/14	

* - QC result out of range

n/a - Not Applicable

May 14, 2014

Quality Control Report

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF140715

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Strontium	7440-24-6		286	ug/L	71.6	70 - 130	1.30	20		05/13/14
Thallium	7440-28-0		33.2	ug/L	83.1	70 - 130	0.60	20		05/13/14
Tin	7440-31-5		36.6	ug/L	91.5	70 - 130	2.40	20		05/13/14
Uranium	7440-61-1		38.2	ug/L	95.4	70 - 130	0.10	20		05/13/14
Arsenic	7440-38-2		34.7	ug/L	86.7	70 - 130	0.30	20		05/13/14
Selenium	7782-49-2		36.1	ug/L	90.3	70 - 130	5.90	20		05/13/14
Thorium	7440-29-1		38.2	ug/L	95.6	70 - 130	1.20	20		05/13/14
Boron	7440-42-8		26.4	ug/L	65.9	70 - 130	0.10	20	N	05/13/14

* - QC result out of range

n/a - Not Applicable

Attention: Scot Fitzgerald

Group #

WSCF140715

Quality Control Comments

Department Inorganic

109329	B2V2Y7(140723001MS)
Analyte	Calcium - ICP-6010 - All possible metals
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.
109330	B2V2Y7(140723001MSD)
Analyte	Calcium - ICP-6010 - All possible metals
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.
110019	B2W7D9(140710007MS)
Analyte	Chromium - ICP-2008 MS All possible metal
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.
110020	B2W7D9(140710007MSD)
Analyte	Chromium - ICP-2008 MS All possible metal
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.

ATTACHMENT4

SAMPLE RECEIPT

Consisting of 7 pages
Including cover page

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

Customer Code: CHPRC
CA CN: 404438
Work Order #: 140715
Customer Work ID: X14-028-028
Due Date: 05/22/2014 **(R031)**

ATTN: Scot Fitzgerald

The following samples were received from you on 4/21/2014 11:15:00 AM. 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
140715001	B2W6C9	WATER	4/21/2014 09:18	4/21/2014 11:15
Procedure		Compound List		
Hexavalent chromium Discrete Analyzer		Cr6		
Sample #	Sample ID	Matrix	Collected	Received
140715002	B2W6C7	WATER	4/21/2014 09:18	4/21/2014 11:15
Procedure		Compound List		
Hexavalent chromium Discrete Analyzer		Cr6		
Sample #	Sample ID	Matrix	Collected	Received
140715003	B2W6K9	WATER	4/21/2014 08:58	4/21/2014 11:15
Procedure		Compound List		
Hexavalent chromium Discrete Analyzer		Cr6		
Sample #	Sample ID	Matrix	Collected	Received
140715004	B2W6L1	WATER	4/21/2014 08:58	4/21/2014 11:15
Procedure		Compound List		
Hexavalent chromium Discrete Analyzer		Cr6		
Sample #	Sample ID	Matrix	Collected	Received
140715005	B2W6C8	WATER	4/21/2014 09:18	4/21/2014 11:15
Procedure		Compound List		
ICP-2008 M S All possible metal		200.8 ICP M S GW01		
ICP-6010 - All possible metals		Fe,Mg,K,Na,Ca		
Sample #	Sample ID	Matrix	Collected	Received
140715006	B2W6C6	WATER	4/21/2014 09:18	4/21/2014 11:15
Procedure		Compound List		
ICP-2008 M S All possible metal		200.8 ICP M S GW01		
ICP-6010 - All possible metals		Fe,Mg,K,Na,Ca		
Tritium by LSC		H3		
Sample #	Sample ID	Matrix	Collected	Received
140715007	B2W6K8	WATER	4/21/2014 08:58	4/21/2014 11:15
Procedure		Compound List		
ICP-2008 M S All possible metal		200.8 ICP M S GW01		
ICP-6010 - All possible metals		Fe,Mg,K,Na,Ca		
Tritium by LSC		H3		

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

Sample #	Sample ID	Matrix	Collected	Received
140715008	B2W6L0	WATER	4/21/2014 08:58	4/21/2014 11:15
Procedure	Compound List			
ICP-2008 M S All possible metal	200.8 ICPM S GW01			
ICP-6010 - All possible metals	Fe,Mg,K,Na,Ca			

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # X14-028-053
Page 1 of 1

Collector	<i>Jan Ayala</i>	Contact/Requester	Karen Waters, Husted	Telephone No.	509-376-4650
SAF No.	X14-028	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303271ESS20
Project Title	IBCS-ADD, APRIL 2014	Labbook No.	HNF-N-506 65 / 43	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	CERCLA	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
 Deleterious Goods Regulations but are not releasable per DOE Order 458.1

Sample No.	Filter	Date	Time	No./Type Container	Received By	Sample Analysis	Holding Time	Preservative
B2M6R9 053	N	4-21-14	0858	1x500-mL AG	7196_CRB: COMMON		24 Hours	Cool-4C
B2M6L1 054	Y	4-21-14	0858	1x500-mL AG	7196_CRB: COMMON		24 Hours	Cool-4C

SPECIAL INSTRUCTIONS
 WELLS
 100-Area Generator Knowledge Information Form applies.
 The CAN for analytical work at WSCF is 401438.

Total Activity Exemption: Yes No

Chain of Custody

Relinquished By	<i>Print</i>	Sign	Date/Time	Received By	<i>Print</i>	Sign	Date/Time
Relinquished By			APR 21 2014 11:15	Received By			APR 21 2014 11:15
Relinquished By				Received By			
Relinquished By				Received By			
Relinquished By				Received By			
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., return to customer, per lab procedure, used in process)			Disposed By			

Matrix *	DS	Dryn Solids
S = Soil	DL	Dryn Liquids
SE = Sediment	T	Tissue
SO = Solid	WI	Wipe
SL = Sludge	L	Liquid
W = Water	V	Vegetation
O = Oil	X	Other:
A = Air		

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A-5004-942 (REV 2)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **X14-028-027**
Page 1 of 1

Collector	Juan Aguilar	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	X14-028	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303271ES20
Project Title	IBC5-ADD, APRIL 2014	Logbook No.	HNF-N-506 65 / 43	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	CERCLA	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
 *** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per DOE Order 458.1
 Dangerous Goods Regulations but are not releasable per DOE Order 458.1

Sample No.	Filter	Date	Time	No./Type Container	Sample Analysis	Holding Time	Preservative
B2W6C8	N	4-21-14	0918	1x500-mL GP	200.8_METALS_ICPMS_GW 01; 6010_METALS_ICP_GW 04	6 Months	HNO3 to pH <2
B2W6C8	N	4-21-14	0918	1x250-mL G	TRITUM_ELIC_LSC_COMMON	6 Months	None
B2W6C8	Y	4-21-14	0918	1x500-mL GP	200.8_METALS_ICPMS_GW 01; 6010_METALS_ICP_GW 04	6 Months	HNO3 to pH <2

Relinquished By	Date	Sign	Date/Time	Received By	Date	Sign	Date/Time	Matrix *
Juan Aguilar	APR 21 2014		11:5	Vic Sup	APR 21 2014		11:5	S = Soil SF = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
								DS = Drum Solids TL = From Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other

Chain of Custody

FINAL SAMPLE DISPOSITION: Disposal Method (e.g., Return to customer, per lab procedure, used in process) _____ Disposed By _____ Date/Time _____

CH2MHILL Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **X14-028-052**
Page 1 of 1

Collector	James Aguilera	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	X14-028	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303271ES20
Project Title	1BC3-ADD, APRIL 2014	Logbook No.	HNFN-506 4/5 / 4/3	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	CERCLA	Priority	31 Days	UHSite 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/DATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS Hold Time Total Activity Exemption: Yes No
 WELLS
 100-Arcs Generator Knowledge information Form applies.
 The CACM for analytical work at WSCF is 404438.

Sample No.	Filter	*	Date	Time	No. Type Container	Received By	Sample Analysis	Holding Time	Preservative
B2W6L0	Y	W	4-21-14	05:58	1x500-mL G/P	200 & METALS ICPMS: GW 01; 6010 METALS ICP: GW 04	6 Months	HNO3 to pH <2	
B2W6H8	N	W	4-21-14	08:58	1x500-mL G/P	200 & METALS ICPMS: GW 01; 6010 METALS ICP: GW 04	6 Months	HNO3 to pH <2	
B2W6K8	N	W	4-21-14	08:58	1x250-mL G	TRITIUM_EIE_LSC: COMMON	6 Months	None	

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
James Aguilera			APR 21 2014 11:15	Vicente S...			APR 21 2014 11:15	S = Soil SE = Sediment SD = Shield SC = Swaps W = Water G = Gill A = Air
Relinquished By			Date/Time	Received By			Date/Time	D5 = Dremm Solids DL = Dremm Liquids T = Tissue W/T = Wipe L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION								Disposal Method (e.g., Return to customer, per lab procedure, used in process):
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A-6004-842 (REV 2)