

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 WSCF140711

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 WSCF140711

- * 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 # WSCF140711
Data Deliverable Date 05/19/14

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
X14-028	B2W6D8	140711001	WATER	04/18/14	04/18/14
X14-028	B2W6F1	140711002	WATER	04/18/14	04/18/14
X14-028	B2W6D9	140711003	WATER	04/18/14	04/18/14
X14-028	B2W6F0	140711004	WATER	04/18/14	04/18/14
X14-028	B2W6D7	140711005	WATER	04/18/14	04/18/14

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):

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

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):

- All 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 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.

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.

Dissolved 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.

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):

Tracers are used to determine chemical yield. RPD is monitored in sample duplicate and is not required for tracer recovery per SOW.

Strontium-89/90:

- All applicable QC controls are within the established limits.

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 37 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 # WSCF140711
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 # WSCF140711

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
232057	232057	2	BLANK	109189	BLANK		Anions by Ion Chromatography (Water)
232057	232057	3	LCS	109190	LCS		Anions by Ion Chromatography (Water)
232057	232057	4	MS	109191	B2W6D8(140711001MS)	140711001	Anions by Ion Chromatography (Water)
232057	232057	5	MSD	109192	B2W6D8(140711001MSD)	140711001	Anions by Ion Chromatography (Water)
232057	232057	8	SAMPLE	140711001	B2W6D8		Anions by Ion Chromatography (Water)
232059	232059	1	BLANK	109200	BLANK		Hexavalent chromium Discrete Analyzer
232059	232059	3	LCS	109202	LCS		Hexavalent chromium Discrete Analyzer
232059	232059	4	DUP	109203	B2W6F1(140711002DUP)	140711002	Hexavalent chromium Discrete Analyzer
232059	232059	5	MS	109204	B2W6F1(140711002MS)	140711002	Hexavalent chromium Discrete Analyzer
232059	232059	6	SAMPLE	140711002	B2W6F1		Hexavalent chromium Discrete Analyzer
232059	232059	17	LCS	109206	LCS		Hexavalent chromium Discrete Analyzer
232059	232059	18	BLANK	109207	BLANK		Hexavalent chromium Discrete Analyzer
232059	232059	19	DUP	109208	B2W712(140713003DUP)	140713003	Hexavalent chromium Discrete Analyzer
232059	232059	20	MS	109209	B2W712(140713003MS)	140713003	Hexavalent chromium Discrete Analyzer
232059	232059	22	SAMPLE	140711003	B2W6D9		Hexavalent chromium Discrete Analyzer
232064	233071	5	BLANK	109230	BLANK		ICP-6010 - All possible metals
232064	233071	7	LCS	109232	LCS		ICP-6010 - All possible metals
232064	233071	8	SAMPLE	140711004	B2W6F0		ICP-6010 - All possible metals
232064	233071	9	MS	109233	B2W6F0(140711004MS)	140711004	ICP-6010 - All possible metals
232064	233071	10	MSD	109234	B2W6F0(140711004MSD)	140711004	ICP-6010 - All possible metals
232064	233071	11	SAMPLE	140711005	B2W6D7		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

Batch QC List

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF140711

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
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	12	SAMPLE	140711004	B2W6F0		ICP-2008 MS All possible metal
233080	233274	13	SAMPLE	140711005	B2W6D7		ICP-2008 MS All possible metal

Batch QC List

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140711

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
232056	232379	1	BLANK	109185	BLANK		Strontium 89/90 (GPC/GEA)
232056	232379	2	LCS	109186	LCS		Strontium 89/90 (GPC/GEA)
232056	232379	3	DUP	109187	B2W8F9(140679006DUP)	140679006	Strontium 89/90 (GPC/GEA)
232056	232379	9	SAMPLE	140711005	B2W6D7		Strontium 89/90 (GPC/GEA)
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	15	SAMPLE	140711005	B2W6D7		Tritium by LSC

Batch QC List

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140711

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
232067	232067	1	LCS	109239	LCS		Total Alkalinity as mg/L CaCO3 (Water)
232067	232067	2	DUP	109240	B2W833(140706004DUP)	140706004	Total Alkalinity as mg/L CaCO3 (Water)
232067	232067	8	SAMPLE	140711005	B2W6D7		Total Alkalinity as mg/L CaCO3 (Water)
232067	232067	12	LCS	109241	LCS		Total Alkalinity as mg/L CaCO3 (Water)
232067	232067	14	LCS	109365	LCS		Total Alkalinity as mg/L CaCO3 (Water)
233070	233070	2	BLANK	109961	BLANK		Total Organic Carbon
233070	233070	3	LCS	109962	LCS		Total Organic Carbon
233070	233070	4	MS	109963	B2W5Y0(140692011MS)	140692011	Total Organic Carbon
233070	233070	5	MSD	109964	B2W5Y0(140692011MSD)	140692011	Total Organic Carbon
233070	233070	11	SAMPLE	140711005	B2W6D7		Total Organic Carbon
233275	233275	2	BLANK	110058	BLANK		Dissolved Organic Carbon
233275	233275	3	LCS	110059	LCS		Dissolved Organic Carbon
233275	233275	4	MS	110060	B2W6L9(140718004MS)	140718004	Dissolved Organic Carbon
233275	233275	5	MSD	110061	B2W6L9(140718004MSD)	140718004	Dissolved Organic Carbon
233275	233275	8	SAMPLE	140711004	B2W6F0		Dissolved Organic Carbon

Method Reference

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140711

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.
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 # WSCF140711

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-220-406	Strontium-89 and 90 in Aqueous Samples by SR-SPEC Separation		
	HEIS	SRTOT_SEP_PRECIP_GPC	Strontium 89/90, by Sr-Spec Sep.
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 # WSCF140711

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>

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140711

Sample # 140711001
 SAF# X14-028
 Sample ID B2W6D8

Matrix WATER
 Sampled 04/18/14
 Received 04/18/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
04/18/14										
Anions by Ion Chromatography (Water)										
Fluoride	16984-48-8	LA-533-410	BDN	0.153		ug/mL	2	0.050	1.0	04/18/14
Chloride	16887-00-6	LA-533-410	DN	7.26		ug/mL	2	0.12	0.80	04/18/14
Nitrite-N	NO2-N	LA-533-410	UD	<0.040		ug/mL	2	0.040	0.20	04/18/14
Nitrate-N	NO3-N	LA-533-410	D	1.38		ug/mL	2	0.040	0.20	04/18/14
Sulfate	14808-79-8	LA-533-410	D	37.1		ug/mL	2	0.22	1.1	04/18/14

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 # WSCF140711

Sample # 140711002
 SAF# X14-028
 Sample ID B2W6F1

Matrix WATER
 Sampled 04/18/14
 Received 04/18/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
04/18/14										
Hexavalent chromium Discrete Analyzer										
Hexavalent chromium	18540-29-9	LA-265-403		0.0108		mg/L	1	0.0020	0.0050	04/18/14

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 # WSCF140711

Sample # 140711003
 SAF# X14-028
 Sample ID B2W6D9

Matrix WATER
 Sampled 04/18/14
 Received 04/18/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/18/14
Hexavalent chromium Discrete Analyzer										
Hexavalent chromium	18540-29-9	LA-265-403		0.0113		mg/L	1	0.0020	0.0050	04/18/14

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 # WSCF140711

Sample # 140711004
 SAF# X14-028
 Sample ID B2W6F0

Matrix WATER
 Sampled 04/18/14
 Received 04/18/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPAES Prep (W)										05/08/14
ICP-6010 - All possible metals										
Iron	7439-89-6	LA-505-411	U	<40		ug/L	1	40	50	05/08/14
Magnesium	7439-95-4	LA-505-411		10200		ug/L	1	60	750	05/08/14
Potassium	7440-09-7	LA-505-411		5340		ug/L	1	250	4000	05/08/14
Sodium	7440-23-5	LA-505-411		11400		ug/L	1	100	500	05/08/14
Calcium	7440-70-2	LA-505-411		41900		ug/L	1	50	1000	05/08/14
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	0.890		ug/L	2	0.20	2.0	05/13/14
Nickel	7440-02-0	LA-505-412	BD	0.626		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	46.2		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	12.2		ug/L	2	0.20	2.0	05/13/14
Cobalt	7440-48-4	LA-505-412	BD	0.324		ug/L	2	0.10	0.50	05/13/14

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
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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 # WSCF140711

Sample # 140711004
 SAF# X14-028
 Sample ID B2W6F0

Matrix WATER
 Sampled 04/18/14
 Received 04/18/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Copper	7440-50-8	LA-505-412	BD	0.486		ug/L	2	0.20	2.0	05/13/14
Zinc	7440-66-6	LA-505-412	BD	4.48		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	10.0		ug/L	2	0.10	1.0	05/13/14
Strontium	7440-24-6	LA-505-412	D	182		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	1.25		ug/L	2	0.10	0.50	05/13/14
Arsenic	7440-38-2	LA-505-412	BD	1.95		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	10.8		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 # WSCF140711

Sample # 140711005
 SAF# X14-028
 Sample ID B2W6D7

Matrix WATER
 Sampled 04/18/14
 Received 04/18/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPAES Prep (W)										05/08/14
ICP-6010 - All possible metals										
Iron	7439-89-6	LA-505-411	U	<40		ug/L	1	40	50	05/08/14
Magnesium	7439-95-4	LA-505-411		10500		ug/L	1	60	750	05/08/14
Potassium	7440-09-7	LA-505-411		5410		ug/L	1	250	4000	05/08/14
Sodium	7440-23-5	LA-505-411		11600		ug/L	1	100	500	05/08/14
Calcium	7440-70-2	LA-505-411		42600		ug/L	1	50	1000	05/08/14
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	0.538		ug/L	2	0.20	2.0	05/13/14
Nickel	7440-02-0	LA-505-412	BD	0.358		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	40.1		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	11.3		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 # WSCF140711

Sample # 140711005
 SAF# X14-028
 Sample ID B2W6D7

Matrix WATER
 Sampled 04/18/14
 Received 04/18/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Copper	7440-50-8	LA-505-412	BD	0.512		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	8.64		ug/L	2	0.10	1.0	05/13/14
Strontium	7440-24-6	LA-505-412	D	159		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	1.05		ug/L	2	0.10	0.50	05/13/14
Arsenic	7440-38-2	LA-505-412	BD	1.84		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	9.30		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 # WSCF140711

Sample # 140711005
 SAF# X14-028
 Sample ID B2W6D7

Matrix WATER
 Sampled 04/18/14
 Received 04/18/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Strontium 89/90 WATER/LIQUID PREP										04/23/14
Strontium 89/90 (GPC/GEA)										
Strontium-89_90	SR-RAD	LA-220-406	U	0.059	.58	pCi/L	1	1.0		04/29/14
Tritium by LSC EICHROM WA/LIQ PREP										04/22/14
Tritium by LSC										
Tritium	10028-17-8	LA-508-421		6200	1300	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 Wet Chemistry

Group # WSCF140711

Sample # 140711004
 SAF# X14-028
 Sample ID B2W6F0

Matrix WATER
 Sampled 04/18/14
 Received 04/18/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
05/12/14										
Dissolved Organic Carbon										
Dissolved Organic Carbon	DOC	LA-344-406	B	0.235		mg/L	1	0.10	0.30	05/12/14

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

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140711

Sample # 140711005
 SAF# X14-028
 Sample ID B2W6D7

Matrix WATER
 Sampled 04/18/14
 Received 04/18/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
04/21/14										
Total Alkalinity as mg/L CaCO3 (Water)										
Total Alkalinity as CaCO3	ALKALINITY	LA-531-411		100		mg/L	1	1	10	04/21/14
Carbonate	CO3ALKALINI	LA-531-411	U	<1		mg/L	1	1		04/21/14
Bicarbonate	71-52-3	LA-531-411		100		mg/L	1	1		04/21/14
Hydroxyl ion	84625-61-6	LA-531-411	U	<1		mg/L	1	1		04/21/14
05/07/14										
Total Organic Carbon										
Total Organic Carbon	TOC	LA-344-406	B	0.199		mg/L	1	0.10	0.30	05/07/14

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

B - Analyte < the 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 # WSCF140711

Analytical Batch 232057 (QC Batch: 232057) Test Anions by Ion Chromatography (Water)
 Associated Samples 140711001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #109189								
Fluoride	16984-48-8	<0.025		ug/mL					U	04/18/14
Chloride	16887-00-6	<0.060		ug/mL					U	04/18/14
Nitrite-N	NO2-N	<0.020		ug/mL					U	04/18/14
Nitrate-N	NO3-N	<0.020		ug/mL					U	04/18/14
Sulfate	14808-79-8	<0.11		ug/mL					U	04/18/14
LCS		QC Sample #109190								
Fluoride	16984-48-8	0.982		ug/mL	99.2	90 - 110				04/18/14
Chloride	16887-00-6	1.87		ug/mL	94.5	90 - 110				04/18/14
Nitrite-N	NO2-N	1.05		ug/mL	107.8	90 - 110				04/18/14
Nitrate-N	NO3-N	0.881		ug/mL	99.6	90 - 110				04/18/14
Sulfate	14808-79-8	3.99		ug/mL	101.8	90 - 110				04/18/14
MS		QC Sample #109191								
		Original 140711001								
Fluoride	16984-48-8	0.153	1.22	ug/mL	122	80 - 120			DN	04/18/14
Chloride	16887-00-6	7.26	2.08	ug/mL	103.8	80 - 120			D	04/18/14
Nitrite-N	NO2-N	<0.040	1.04	ug/mL	104.9	80 - 120			D	04/18/14
Nitrate-N	NO3-N	1.38	0.934	ug/mL	104.5	80 - 120			D	04/18/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140711

Analytical Batch 232059 (QC Batch: 232059) Test Hexavalent chromium Discrete Analyzer
 Associated Samples 140711002, 140711003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
			QC Sample #109200							
Hexavalent chromium LCS	18540-29-9		<0.0020	mg/L					U	04/18/14
			QC Sample #109202							
Hexavalent chromium DUP	18540-29-9		0.0544	mg/L	108.8	90 - 110				04/18/14
			QC Sample #109203							
			Original 140711002							
Hexavalent chromium MS	18540-29-9	0.0108	0.0103	mg/L			4.70	20		04/18/14
			QC Sample #109204							
			Original 140711002							
Hexavalent chromium LCS	18540-29-9	0.0108	0.0427	mg/L	106.8	85 - 115				04/18/14
			QC Sample #109206							
Hexavalent chromium BLANK	18540-29-9		0.0531	mg/L	106.2	90 - 110				04/18/14
			QC Sample #109207							
Hexavalent chromium DUP	18540-29-9		<0.0020	mg/L					U	04/18/14
			QC Sample #109208							
			Original 140713003							
Hexavalent chromium	18540-29-9		0.0116	mg/L			2.60	20		04/18/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

May 14, 2014

Attention Scot Fitzgerald
Department Inorganic

Group # WSCF140711

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MS			QC Sample #109209							
			Original 140713003							
Hexavalent chromium	18540-29-9		0.0424	mg/L	106	85 - 115				04/18/14
* - QC result out of range				n/a - Not Applicable						

Quality Control Report

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140711

Analytical Batch 232067 (QC Batch: 232067) Test Total Alkalinity as mg/L CaCO3 (Water)
 Associated Samples 140711005

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
LCS			QC Sample #109239							
Total Alkalinity as CaCO3	ALKALINITY	94		mg/L	93.7	80 - 120				04/21/14
DUP			QC Sample #109240							
			Original 140706004							
Total Alkalinity as CaCO3	ALKALINITY	100		mg/L			1.90	20		04/21/14
LCS			QC Sample #109241							
Total Alkalinity as CaCO3	ALKALINITY	97		mg/L	97.4	80 - 120				04/21/14
LCS			QC Sample #109365							
Total Alkalinity as CaCO3	ALKALINITY	97		mg/L	97.4	80 - 120				04/21/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140711

Analytical Batch 232256 (QC Batch: 232060) Test Tritium by LSC
 Associated Samples 140711005

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

May 14, 2014

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140711

Analytical Batch 232379 (QC Batch: 232056) Test Strontium 89/90 (GPC/GEA)
 Associated Samples 140711005

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #109185								
Strontium-89_90	SR-RAD		0.19	pCi/L					U	04/29/14
LCS		QC Sample #109186								
Strontium-89_90	SR-RAD		35	pCi/L	96	80 - 120				04/29/14
DUP		QC Sample #109187								
		Original 140679006								
Strontium-89_90	SR-RAD		-0.19	pCi/L			-42.50	20	* U	04/29/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140711

Analytical Batch 233070 (QC Batch: 233070) Test Total Organic Carbon
 Associated Samples 140711005

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #109961								
Total Organic Carbon	TOC		<0.045	mg/L					U	05/07/14
LCS		QC Sample #109962								
Total Organic Carbon	TOC		2.09	mg/L	104.4	80 - 120				05/07/14
MS		QC Sample #109963								
		Original 140692011								
Total Organic Carbon	TOC		2.06	mg/L	102.9	75 - 125				05/07/14
MSD		QC Sample #109964								
		Original 140692011								
Total Organic Carbon	TOC		2.06	mg/L	103.1	75 - 125	0.20	20	Paired 109963	05/07/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140711

Analytical Batch 233071 (QC Batch: 232064) Test ICP-6010 - All possible metals
 Associated Samples 140711004, 140711005

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #109230								
Iron	7439-89-6	<40		ug/L					U	05/08/14
Magnesium	7439-95-4	<60		ug/L					U	05/08/14
Potassium	7440-09-7	<250		ug/L					U	05/08/14
Sodium	7440-23-5	<100		ug/L					U	05/08/14
Calcium	7440-70-2	<50		ug/L					U	05/08/14
LCS		QC Sample #109232								
Iron	7439-89-6	1100		ug/L	109.6	80 - 120				05/08/14
Magnesium	7439-95-4	10600		ug/L	106.3	80 - 120				05/08/14
Potassium	7440-09-7	9730		ug/L	97.3	80 - 120				05/08/14
Sodium	7440-23-5	10700		ug/L	107.4	80 - 120				05/08/14
Calcium	7440-70-2	21200		ug/L	106.2	80 - 120				05/08/14
MS		QC Sample #109233								
		Original 140711004								
Iron	7439-89-6	<40	1110	ug/L	111.2	75 - 125				05/08/14
Magnesium	7439-95-4	10200	10800	ug/L	108	75 - 125				05/08/14
Potassium	7440-09-7	5340	9970	ug/L	99.7	75 - 125				05/08/14
Sodium	7440-23-5	11400	10800	ug/L	107.8	75 - 125				05/08/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140711

Analytical Batch 233274 (QC Batch: 233080) Test ICP-2008 MS All possible metal
 Associated Samples 140711004, 140711005

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 # WSCF140711

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 # WSCF140711

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 # WSCF140711

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

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF140711

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

Quality Control Report

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF140711

Analytical Batch 233275 (QC Batch: 233275) Test Dissolved Organic Carbon
 Associated Samples 140711004

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #110058								
Dissolved Organic Carbon	DOC		<0.045	mg/L					U	05/12/14
LCS		QC Sample #110059								
Dissolved Organic Carbon	DOC		2.16	mg/L	108.2	80 - 120				05/12/14
MS		QC Sample #110060								
		Original 140718004								
Dissolved Organic Carbon	DOC		2.06	mg/L	103	75 - 125				05/12/14
MSD		QC Sample #110061								
		Original 140718004								
Dissolved Organic Carbon	DOC		2.06	mg/L	103.2	75 - 125	0.20	20	Paired 110060	05/12/14

* - QC result out of range

n/a - Not Applicable

Quality Control Report

May 14, 2014

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF140711

Analytical Batch 232379 (QC Batch: 232056) Test Strontium 89/90 (GPC/GEA)
 Associated Samples 140711005

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
Strontium Nitrate	10042-76-9			mg	86	25 - 105				04/29/14
LCS										
Strontium Nitrate	10042-76-9			mg	86.8	25 - 105				04/29/14
DUP										
Strontium Nitrate	10042-76-9			mg	76.9	25 - 105	n/a			04/29/14
SAMPLE										
Strontium Nitrate	10042-76-9			mg	81.8	25 - 105				04/29/14

* - QC result out of range

n/a - Not Applicable

Attention: Scot Fitzgerald

Group #

WSCF140711

Quality Control Comments

Department Inorganic

109191	B2W6D8(140711001MS)
Analyte	Sulfate - Anions by Ion Chromatography (Water)
[1]	X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.
109192	B2W6D8(140711001MSD)
Analyte	Sulfate - Anions by Ion Chromatography (Water)
[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 5 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

ATTN: Scot Fitzgerald

Customer Code: CHPRC
CA CN: 404438
Work Order #: 140711
Customer Work ID: X14-028-033
Due Date: 05/19/2014 **(R031)**

The following samples were received from you on 4/18/2014 1:40:00 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
140711001	B2W6D8	WATER	4/18/2014 13:03	4/18/2014 13:40
Procedure		Compound List		
Anions by Ion Chromatography (Water)		F,Cl,NO2,NO3,SO4		
Sample #	Sample ID	Matrix	Collected	Received
140711002	B2W6F1	WATER	4/18/2014 13:03	4/18/2014 13:40
Procedure		Compound List		
Hexavalent chromium Discrete Analyzer		Cr6		
Sample #	Sample ID	Matrix	Collected	Received
140711003	B2W6D9	WATER	4/18/2014 13:03	4/18/2014 13:40
Procedure		Compound List		
Hexavalent chromium Discrete Analyzer		Cr6		
Sample #	Sample ID	Matrix	Collected	Received
140711004	B2W6F0	WATER	4/18/2014 13:03	4/18/2014 13:40
Procedure		Compound List		
Dissolved Organic Carbon		DOC		
ICP-2008 MS All possible metal		200.8 ICPMS GW01		
ICP-6010 - All possible metals		Fe,Mg,K,Na,Ca		
Sample #	Sample ID	Matrix	Collected	Received
140711005	B2W6D7	WATER	4/18/2014 13:03	4/18/2014 13:40
Procedure		Compound List		
ICP-2008 MS All possible metal		200.8 ICPMS GW01		
ICP-6010 - All possible metals		Fe,Mg,K,Na,Ca		
Strontium 89/90 (GPC/GEA)		SR89/90		
Total Alkalinity as mg/L CaCO3 (Water)		Alkalinity,Carbonate,Bicarbonate,Hydroxyl Ion		
Total Organic Carbon		TOC		
Tritium by LSC		H3		

Chain of Custody

CH2MHill Plateau Remediation		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				COC # X14-028-034
Company						Page 1 of 1
Collector	<i>Juan Aguilar</i>	Contact/Requester	Karen Waters-Illstedt		Telephone No.	509-376-4650
SAF No.	X14-028	Sampling Origin	Hanford Site		Purchase Order/Charge Code	30327IBS20
Project Title	IBC5-ADD, APRIL 2014	Logbook No.	HNF-N-506 41/45		Ice Chart No.	N/A
Shipped to (Lab)	Waste Sampling & Characterization	Method of Shipment	GOVERNMENT VEHICLE		Bill of Lading/Air Bill No.	N/A
Protocol	CHRCIA	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/49A Dangerous Goods Regulations but are not releasable per DOE Order 458.1.				SPECIAL INSTRUCTIONS		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
				WELLS 100-Area Generator Knowledge Information Form applies. The CMCN for analytical work at WACF S 40445K		
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time
B2M6F1	Y	4-18-14	1303	1x500-mL 3G	7198_CRB: COMMON	24 Hours
B2M6C9	N	4-18-14	1303	1x200-mL 3G	7198_CRB: COMMON	24 Hours
Retinquished By	Initial	Sign	Date/Time	Received By	Date	Sign
<i>Juan Aguilar</i>	<i>[Signature]</i>		APR 18 2014 1340	<i>[Signature]</i>		APR 18 2014 1340
Retinquished By			Date/Time	Received By		Date/Time
Retinquished By			Date/Time	Received By		Date/Time
Retinquished By			Date/Time	Received By		Date/Time
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time

PRINTED ON 3/4/2014

A-5004-942 (REV 2)

- Matrix *
- S = Soil
 - SE = Sediment
 - SO = Solid
 - SL = Sludge
 - W = Water
 - O = Oil
 - A = Air
 - DS = Duna Solids
 - DL = Duna Liquids
 - F = Tissue
 - WT = Wipe
 - L = Liquid
 - V = Vapour
 - X = Other

Chain of Custody

CH2M Hill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. # X14-028-032	
Collector: <u>Juan Aguilar</u>		Contact/Requester: <u>Karen Waters-Husted</u>		Telephone No.: <u>509-376-4650</u>		Page 1 of 1	
SAF No: <u>X14-028</u>		Sampling Origin: <u>Hanford Site</u>		Purchase Order/Charge Code: <u>303271ESS20</u>			
Project Title: <u>IBC5-ADD, APRIL 2014</u>		Logbook No.: <u>HNF-N-506 611/95</u>		Ice Chest No.: <u>N/A</u>			
Shipped To (Lab): <u>Waste Sampling & Characterization</u>		Method of Shipment: <u>GOVERNMENT VEHICLE</u>		Bill of Lading/Air-Bill No.: <u>N/A</u>			
Protocol: <u>CERCLA</u>		Priority: <u>31 Days</u>		Offsite Property No.: <u>N/A</u>			
<p>POSSIBLE SAMPLE HAZARDS/REMARKS</p> <p>** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/DATA</p> <p>Dangerous Goods Regulations but are not releasable per DOE Order 458.1.</p>				<p>SPECIAL INSTRUCTIONS</p> <p>**WELLS**</p> <p>100 Area Generator Knowledge Information Form applies.</p> <p>The CACH for analytical work at WSCF is 404438.</p>		<p>Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2W6D7	N	4-18-14	1303	1x500-mL G/P	200 8 METALS ICPMS: GW 01; 6010 METALS ICP: GW 04	6 Months	HNO3 to pH <2
B2W6D7	N			1x250-mL G/P	2320 ALKALINITY: GW 01	14 Days	COOL-4C
B2W6D7	N			1x250-mL AG	9080 TOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool-4C
B2W6D7	N			1x1 L G/P	SRTOT_SEP_PRECIP_GPC: COMMON	6 Months	HNO3 to pH <2
B2W6D7	N			1x250-mL G	TRITIUM_ELE_LSC: COMMON	6 Months	None
B2W6F0	Y			1x500-mL G/P	200 8 METALS ICPMS: GW 01; 6010 METALS ICP: GW 04	6 Months	HNO3 to pH <2
B2W6F0	Y	4-18-14	1303	1x250-mL AG	9090 DOC: COMMON	28 Days	HCl or H2SO4 to pH <2/Cool-4C

Relinquished By: <u>Juan Aguilar</u>	Print	Sign	Date/Time: <u>APR 18 2014 1340</u>	Received By: <u>[Signature]</u>	Print	Sign	Date/Time: <u>APR 18 2014 1340</u>
Relinquished By:			Date/Time:	Received By:			Date/Time:
Relinquished By:			Date/Time:	Received By:			Date/Time:
Relinquished By:			Date/Time:	Received By:			Date/Time:
FINAL SAMPLE DISPOSITION				Dispose of by:			
Disposal Method (e.g., Return to customer, per lab procedure, used in process):				Dispose of by:			

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A-5004-8-2 (REV 2)