

DECEMBER 10, 2012

**WSCF Laboratory**

PO Box 650 S3-30  
Richland, WA 99352



December 10, 2012

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

Dear Scot Fitzgerald,

**FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF121424**

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 WSCF121424

- \* 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 "Dan T. Smith".

Electronically signed by Joseph Hale  
For Lab Manager, Dan T. Smith  
WSCF Analytical Lab  
(509) 373-4804

Attachments 4

CC: w/Attachments

File/LB

**DECEMBER 10, 2012**

**ATTACHMENT 1**

**COVER SHEET**

Consisting of 2 pages  
Including cover page

**WSCF SAF Number Cross Reference**

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Group # WSCF121424  
Data Deliverable Date 12/10/12

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
I13-002	B2MRW3	121424001	WATER	11/06/12	11/06/12
I13-002	B2MRW2	121424002	WATER	11/06/12	11/06/12
I13-002	B2MRW1	121424003	WATER	11/06/12	11/06/12
I13-002	B2MRW4	121424004	WATER	11/06/12	11/06/12

DECEMBER 10, 2012

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), Master Contract 39818, Revision 3, "Laboratory Analytical Services to CHPRC Soil and Groundwater Remediation Project."*

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.

**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 Duplicate, 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.

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

- All applicable QC controls are within the established limits.

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

- All applicable QC controls are within the established limits.

### **Organic Comments**

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

- All applicable QC controls are within the established limits.

### **Radiochemistry Comments**

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

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.

**Technetium-99:**

- All applicable QC controls are within the established limits.

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

DECEMBER 10, 2012

ATTACHMENT 3

**ANALYTICAL RESULTS**

Consisting of 36 pages  
Including cover page

DECEMBER 10, 2012

## WSCF ANALYTICAL RESULTS REPORT

For

CH2M Hill Plateau Remediation

PO Box 1600  
Richland, WA 99352

Attention: Scot Fitzgerald

**Contract #** MOA-FH-CHPRC-2008  
**Group #** WSCF121424  
**Report Date** December 10, 2012

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 # WSCF121424

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
209870	209870	1	BLANK	84614	BLANK		Hexavalent chromium Discrete Analyzer
209870	209870	3	LCS	84616	LCS		Hexavalent chromium Discrete Analyzer
209870	209870	4	DUP	84617	B2MRW3(121424001DU	121424001	Hexavalent chromium Discrete Analyzer
209870	209870	5	MS	84618	B2MRW3(121424001MS)	121424001	Hexavalent chromium Discrete Analyzer
209870	209870	6	SAMPLE	121424001	B2MRW3		Hexavalent chromium Discrete Analyzer
209929	209929	2	BLANK	84713	BLANK		Anions by Ion Chromatography (Water)
209929	209929	3	LCS	84714	LCS		Anions by Ion Chromatography (Water)
209929	209929	4	DUP	84715	B2MRJ7(121410021DUP)	121410021	Anions by Ion Chromatography (Water)
209929	209929	5	MS	84716	B2MRJ7(121410021MS)	121410021	Anions by Ion Chromatography (Water)
209929	209929	6	MSD	84717	B2MRJ7(121410021MSD)	121410021	Anions by Ion Chromatography (Water)
209929	209929	20	SAMPLE	121424002	B2MRW2		Anions by Ion Chromatography (Water)
210826	210924	4	BLANK	85610	BLANK		ICP-2008 MS All possible metal
210826	210924	5	LCS	85611	LCS		ICP-2008 MS All possible metal
210826	210924	7	MS	85612	B2MMJ7(121411010MS)	121411010	ICP-2008 MS All possible metal
210826	210924	8	MSD	85613	B2MMJ7(121411010MSD)	121411010	ICP-2008 MS All possible metal
210826	210924	20	SAMPLE	121424003	B2MRW1		ICP-2008 MS All possible metal
210826	210924	21	SAMPLE	121424004	B2MRW4		ICP-2008 MS All possible metal

DECEMBER 10, 2012

Batch QC List

Attention Scot Fitzgerald  
Department Organic, Volatiles

Group # WSCF121424

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
209925	209927	1	BLANK	84701	BLANK		SW-846 8260B Volatiles
209925	209927	2	LCS	84702	LCS		SW-846 8260B Volatiles
209925	209927	3	MS	84703	B2MN89(121404001MS) 121404001		SW-846 8260B Volatiles
209925	209927	4	MSD	84704	B2MN89(121404001MSD 121404001		SW-846 8260B Volatiles
209925	209927	12	SAMPLE	121424003	B2MRW1		SW-846 8260B Volatiles

**DECEMBER 10, 2012**

**Batch QC List**

**Attention** Scot Fitzgerald  
**Department** Radiochemistry

**Group #** WSCF121424

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
209864	209945	1	BLANK	84577	BLANK		Tritium by LSC
209864	209945	2	LCS	84578	LCS		Tritium by LSC
209864	209945	4	DUP	84579	B2LF07(121414001DUP)	121414001	Tritium by LSC
209864	209945	5	MS	84580	B2LF07(121414001MS)	121414001	Tritium by LSC
209864	209945	11	SAMPLE	121424003	B2MRW1		Tritium by LSC
209915	209939	1	BLANK	84679	BLANK		TC99 by Liquid Scintillation
209915	209939	2	LCS	84680	LCS		TC99 by Liquid Scintillation
209915	209939	4	DUP	84681	B2MNX8(121411014DUP)	121411014	TC99 by Liquid Scintillation
209915	209939	5	MS	84682	B2MNX8(121411014MS)	121411014	TC99 by Liquid Scintillation
209915	209939	11	SAMPLE	121424003	B2MRW1		TC99 by Liquid Scintillation
210239	210915	1	BLANK	84908	BLANK		Strontium 89/90 (GPC/GEA)
210239	210915	2	LCS	84909	LCS		Strontium 89/90 (GPC/GEA)
210239	210915	3	DUP	84910	B2MPD0(121411001DUP)	121411001	Strontium 89/90 (GPC/GEA)
210239	210915	10	SAMPLE	121424003	B2MRW1		Strontium 89/90 (GPC/GEA)

DECEMBER 10, 2012

Batch QC List

Attention Scot Fitzgerald  
Department Wet Chemistry

Group # WSCF121424

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
210122	210122	1	LCS	84826	LCS		Total Alkalinity as mg/L CaCO <sub>3</sub> (Water)
210122	210122	5	DUP	84827	B2LLT4(121422001DUP) 121422001		Total Alkalinity as mg/L CaCO <sub>3</sub> (Water)
210122	210122	6	SAMPLE	121424003	B2MRW1		Total Alkalinity as mg/L CaCO <sub>3</sub> (Water)
210122	210122	13	LCS	84828	LCS		Total Alkalinity as mg/L CaCO <sub>3</sub> (Water)
210122	210122	19	LCS	84829	LCS		Total Alkalinity as mg/L CaCO <sub>3</sub> (Water)

**Attention** Scot Fitzgerald  
**Department** Inorganic

**Group #** WSCF121424

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.

<b>LA-265-403</b>	Hexavalent Chromium Analysis		
	EPA SW-846	7196A	Hexavalent Chromium
	HEIS	7196_CR6	Hexavalent Chromium
<b>LA-505-412</b>	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.
<b>LA-533-410</b>	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>

Attention Scot Fitzgerald  
Department Organic, Volatiles

Group # WSCF121424

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-523-455	Volatile Sample Analysis by SW-846 Method 8260B	
EPA SW-846	8000B	Determinative Chromographic Separations
EPA SW-846	8260B	Volatile Organic Compounds by Gas
		Chromatography/Mass Spectrometry (GC/MS)
HEIS	8260_VOA_GCMS	Volatile Organic Compounds by Gas
		Chromatography/Mass Spectrometry (GC/MS)

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** Radiochemistry

**Group #** WSCF121424

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-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>

Attention Scot Fitzgerald  
Department Wet Chemistry

Group # WSCF121424

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

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 # WSCF121424

Sample # 121424001  
SAF# I13-002  
Sample ID B2MRW3

Matrix WATER  
Sampled 11/06/12  
Received 11/06/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
11/06/12										
<b>Hexavalent chromium Discrete Analyzer</b>										
Hexavalent chromium	18540-29-9	LA-265-403		0.0194		mg/L	1	0.0020	0.0050	11/06/12

MDL = Minimum Detection Limit

RQ = Result Qualifier

TP Err = Total Propagated Error

DF = Dilution Factor

+ - Indicates more than nine qualifier

B - Analyte &lt; the PQL(or EQL)but &gt;= 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.

o - LCS recovery outside established laboratory acceptance limits.

**Attention** Scot Fitzgerald  
**Department** Inorganic

**Group #** WSCF121424

**Sample #** 121424002  
**SAF#** I13-002  
**Sample ID** B2MRW2

**Matrix** WATER  
**Sampled** 11/06/12  
**Received** 11/06/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
11/07/12										
<b>Anions by Ion Chromatography (Water)</b>										
Fluoride	16984-48-8	LA-533-410	D	0.213		ug/mL	2	0.046	0.14	11/07/12
Chloride	16887-00-6	LA-533-410	D	22.8		ug/mL	2	0.12	0.81	11/07/12
Nitrite-N	NO2-N	LA-533-410	UD	<0.038		ug/mL	2	0.038	0.20	11/07/12
Nitrate-N	NO3-N	LA-533-410	D	3.71		ug/mL	2	0.038	0.20	11/07/12
Sulfate	14808-79-8	LA-533-410	D	103		ug/mL	2	0.22	2.1	11/07/12

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.

o - LCS recovery outside established laboratory acceptance limits.

**Attention** Scot Fitzgerald  
**Department** Inorganic

**Group #** WSCF121424

**Sample #** 121424003  
**SAF#** I13-002  
**Sample ID** B2MRW1

**Matrix** WATER  
**Sampled** 11/06/12  
**Received** 11/06/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>ICPMS Prep (W)</b>										11/28/12
<b>ICP-2008 MS All possible metal</b>										
Aluminum	7429-90-5	LA-505-412	BD	17.7		ug/L	2	10	100	11/29/12
Silver	7440-22-4	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	11/29/12
Antimony	7440-36-0	LA-505-412	UD	<0.60		ug/L	2	0.60	6.0	11/29/12
Barium	7440-39-3	LA-505-412	D	29.4		ug/L	2	0.40	4.0	11/29/12
Beryllium	7440-41-7	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	11/29/12
Cadmium	7440-43-9	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	11/29/12
Chromium	7440-47-3	LA-505-412	D	32.8		ug/L	2	0.20	2.0	11/29/12
Cobalt	7440-48-4	LA-505-412	BD	0.106		ug/L	2	0.10	0.50	11/29/12
Copper	7440-50-8	LA-505-412	BD	0.758		ug/L	2	0.20	2.0	11/29/12
Lead	7439-92-1	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	11/29/12
Molybdenum	7439-98-7	LA-505-412	D	8.46		ug/L	2	0.10	1.0	11/29/12
Thallium	7440-28-0	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	11/29/12
Tin	7440-31-5	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	11/29/12
Arsenic	7440-38-2	LA-505-412	BD	3.71		ug/L	2	0.40	4.0	11/29/12
Selenium	7782-49-2	LA-505-412	BD	3.64		ug/L	2	2.0	20	11/29/12

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.

o - LCS recovery outside established laboratory acceptance limits.

**Attention** Scot Fitzgerald  
**Department** Inorganic

**Group #** WSCF121424

**Sample #** 121424004  
**SAF#** I13-002  
**Sample ID** B2MRW4

**Matrix** WATER  
**Sampled** 11/06/12  
**Received** 11/06/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>ICPMS Prep (W)</b>										11/28/12
<b>ICP-2008 MS All possible metal</b>										
Aluminum	7429-90-5	LA-505-412	UD	<10		ug/L	2	10	100	11/29/12
Silver	7440-22-4	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	11/29/12
Antimony	7440-36-0	LA-505-412	UD	<0.60		ug/L	2	0.60	6.0	11/29/12
Barium	7440-39-3	LA-505-412	D	27.1		ug/L	2	0.40	4.0	11/29/12
Beryllium	7440-41-7	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	11/29/12
Cadmium	7440-43-9	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	11/29/12
Chromium	7440-47-3	LA-505-412	D	24.0		ug/L	2	0.20	2.0	11/29/12
Cobalt	7440-48-4	LA-505-412	UD	<0.10		ug/L	2	0.10	0.50	11/29/12
Copper	7440-50-8	LA-505-412	BD	0.232		ug/L	2	0.20	2.0	11/29/12
Lead	7439-92-1	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	11/29/12
Molybdenum	7439-98-7	LA-505-412	D	8.17		ug/L	2	0.10	1.0	11/29/12
Thallium	7440-28-0	LA-505-412	BD	0.274		ug/L	2	0.10	1.0	11/29/12
Tin	7440-31-5	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	11/29/12
Arsenic	7440-38-2	LA-505-412	BD	3.28		ug/L	2	0.40	4.0	11/29/12
Selenium	7782-49-2	LA-505-412	BD	3.73		ug/L	2	2.0	20	11/29/12

MDL = Minimum Detection Limit

RQ = Result Qualifier

TP Err = Total Propagated Error

DF = Dilution Factor

+ - Indicates more than nine qualifier

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o - LCS recovery outside established laboratory acceptance limits.

**Attention** Scot Fitzgerald  
**Department** Organic, Volatiles

**Group #** WSCF121424

**Sample #** 121424003  
**SAF#** I13-002  
**Sample ID** B2MRW1

**Matrix** WATER  
**Sampled** 11/06/12  
**Received** 11/06/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>Preparation for 8260B (W)</b>										11/08/12
<b>SW-846 8260B Volatiles</b>										
1,1-Dichloroethene	75-35-4	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Trichloroethene	79-01-6	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Benzene	71-43-2	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Toluene	108-88-3	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Chlorobenzene	108-90-7	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
1,1-Dichloroethane	75-34-3	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Ethylbenzene	100-41-4	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
1,2-Dichloroethane	107-06-2	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Methyl isobutyl ketone	108-10-1	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Tetrachloroethene	127-18-4	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Total Xylenes	1330-20-7	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Carbon tetrachloride	56-23-5	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Acetone	67-64-1	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Chloroform	67-66-3	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
1,1,1-Trichloroethane	71-55-6	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Vinyl chloride	75-01-4	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Methylene chloride	75-09-2	LA-523-455	U	<1		ug/L	1	1	5	11/09/12

MDL = Minimum Detection Limit

RQ = Result Qualifier

TP Err = Total Propagated Error

DF = Dilution Factor

+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE

D - Analyte was reported at a secondary dilution factor.

E - The calibration exceeds the calibration range (GC/MS).

J - Analyte < PQL (or EQL) >= MDL.

N - Presumed evidence based on MS library search(GC/MS only)

T - GC/MS or N - Non GC/MS - MS/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** Organic, Volatiles

**Group #** WSCF121424

**Sample #** 121424003  
**SAF#** I13-002  
**Sample ID** B2MRW1

**Matrix** WATER  
**Sampled** 11/06/12  
**Received** 11/06/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Carbon disulfide	75-15-0	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Methyl ethyl ketone	78-93-3	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
1,1,2-Trichloroethane	79-00-5	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
1-Butanol	71-36-3	LA-523-455	U	<100		ug/L	1	100	500	11/09/12
Tetrahydrofuran	109-99-9	LA-523-455	U	<2		ug/L	1	2	10	11/09/12
trans-1,2-Dichloroethene	156-60-5	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
cis-1,2-Dichloroethene	156-59-2	LA-523-455	U	<1		ug/L	1	1	5	11/09/12
Propionitrile	107-12-0	LA-523-455	U	<2		ug/L	1	2	10	11/09/12
1,4-Dichlorobenzene	106-46-7	LA-523-455	U	<1		ug/L	1	1	5	11/09/12

MDL = Minimum Detection Limit

RQ = Result Qualifier

TP Err = Total Propagated Error

DF = Dilution Factor

+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE

D - Analyte was reported at a secondary dilution factor.

E - The calibration exceeds the calibration range (GC/MS).

J - Analyte < PQL (or EQL) >= MDL.

N - Presumed evidence based on MS library search(GC/MS only)

T - GC/MS or N - Non GC/MS - MS/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 #** WSCF121424

**Sample #** 121424003  
**SAF#** I13-002  
**Sample ID** B2MRW1

**Matrix** WATER  
**Sampled** 11/06/12  
**Received** 11/06/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>Strontium 89/90 WATER/LIQUID PREP</b>										11/28/12
<b>Strontium 89/90 (GPC/GEA)</b>										
Strontium-89_90	SR-RAD	LA-220-406	U	-0.88	.62	pCi/L	1	1.1		12/04/12
<b>TC99 by Liquid Scin. WATER/LIQUID PREP</b>										11/08/12
<b>TC99 by Liquid Scintillation</b>										
Technetium-99	14133-76-7	LA-508-421	U	-3.2	4	pCi/L	1	6.7		11/11/12
<b>Tritium by LSC EICHROM WA/LIQ PREP</b>										11/07/12
<b>Tritium by LSC</b>										
Tritium	10028-17-8	LA-508-421	U	37	32	pCi/L	1	300		11/12/12

MDL = Minimum Detection Limit

RQ = Result Qualifier

TP Err = Total Propagated Error

DF = Dilution Factor

+ - Indicates more than nine qualifier

B - Analyte was detected in both the BLANK and SAMPLE

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 # WSCF121424

Sample # 121424003  
SAF# I13-002  
Sample ID B2MRW1

Matrix WATER  
Sampled 11/06/12  
Received 11/06/12

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										11/12/12
<b>Total Alkalinity as mg/L CaCO<sub>3</sub> (Water)</b>										
Total Alkalinity as CaCO <sub>3</sub>	ALKALINITY	LA-531-411		100		mg/L	1	1	10	11/12/12

MDL = Minimum Detection Limit

RQ = Result Qualifier

TP Err = Total Propagated Error

DF = Dilution Factor

+ - Indicates more than nine qualifier

B - Analyte &lt; the RDL but &gt;= 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.

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF121424

Analytical Batch 209870 (QC Batch: 209870) Test Hexavalent chromium Discrete Analyzer  
 Associated Samples 121424001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>										<b>QC Sample #84614</b>
Hexavalent chromium 18540-29-9 <0.0020 mg/L										U 11/06/12
<b>LCS</b>										<b>QC Sample #84616</b>
Hexavalent chromium 18540-29-9 0.0510 mg/L 102 90 - 110										11/06/12
<b>DUP</b>										<b>QC Sample #84617</b>
Hexavalent chromium 18540-29-9 0.0194 0.0188 mg/L 3.10 20										11/06/12
<b>MS</b>										<b>Original 121424001</b>
Hexavalent chromium 18540-29-9 0.0194 0.0417 mg/L 104.2 85 - 115										11/06/12

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
 Department Organic, Volatiles

Group # WSCF121424

Analytical Batch 209927 (QC Batch: 209925) Test SW-846 8260B Volatiles  
 Associated Samples 121424003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>										QC Sample #84701
1,1-Dichloroethene	75-35-4	<1		ug/L				U		11/09/12
Trichloroethene	79-01-6	<1		ug/L				U		11/09/12
Benzene	71-43-2	<1		ug/L				U		11/09/12
Toluene	108-88-3	<1		ug/L				U		11/09/12
Chlorobenzene	108-90-7	<1		ug/L				U		11/09/12
1,1-Dichloroethane	75-34-3	<1		ug/L				U		11/09/12
Ethylbenzene	100-41-4	<1		ug/L				U		11/09/12
1,2-Dichloroethane	107-06-2	<1		ug/L				U		11/09/12
Methyl isobutyl ketone	108-10-1	<1		ug/L				U		11/09/12
Tetrachloroethene	127-18-4	<1		ug/L				U		11/09/12
Total Xylenes	1330-20-7	<1		ug/L				U		11/09/12
Carbon tetrachloride	56-23-5	<1		ug/L				U		11/09/12
Acetone	67-64-1	<1		ug/L				U		11/09/12
Chloroform	67-66-3	<1		ug/L				U		11/09/12
1,1,1-Trichloroethane	71-55-6	<1		ug/L				U		11/09/12
Vinyl chloride	75-01-4	<1		ug/L				U		11/09/12
Methylene chloride	75-09-2	<1		ug/L				U		11/09/12

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
 Department Organic, Volatiles

Group #

WSCF121424

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Carbon disulfide	75-15-0		<1	ug/L					U	11/09/12
Methyl ethyl ketone	78-93-3		<1	ug/L					U	11/09/12
1,1,2-Trichloroethane	79-00-5		<1	ug/L					U	11/09/12
1-Butanol	71-36-3		<100	ug/L					U	11/09/12
Tetrahydrofuran	109-99-9		<2	ug/L					U	11/09/12
trans-1,2-Dichloroethene	156-60-5		<1	ug/L					U	11/09/12
cis-1,2-Dichloroethene	156-59-2		<1	ug/L					U	11/09/12
Propionitrile	107-12-0		<2	ug/L					U	11/09/12
1,4-Dichlorobenzene	106-46-7		<1	ug/L					U	11/09/12
<b>LCS</b>			<b>QC Sample #84702</b>							
1,1-Dichloroethene	75-35-4		23	ug/L	90.4	75 - 125				11/09/12
Trichloroethene	79-01-6		25	ug/L	99.7	75 - 125				11/09/12
Benzene	71-43-2		26	ug/L	105.9	75 - 125				11/09/12
Toluene	108-88-3		27	ug/L	107.4	75 - 125				11/09/12
Chlorobenzene	108-90-7		26	ug/L	105.2	75 - 125				11/09/12
1,1-Dichloroethane	75-34-3		25	ug/L	98.4	75 - 125				11/09/12
Ethylbenzene	100-41-4		28	ug/L	111	75 - 125				11/09/12
1,2-Dichloroethane	107-06-2		27	ug/L	107.5	75 - 125				11/09/12
1,1,1-Trichloroethane	71-55-6		26	ug/L	103	75 - 125				11/09/12
Carbon disulfide	75-15-0		21	ug/L	85	75 - 125				11/09/12
1,1,2-Trichloroethane	79-00-5		27	ug/L	109.4	75 - 125				11/09/12

\* - QC result out of range

n/a - Not Applicable

**DECEMBER 10, 2012**

**Quality Control Report**

Attention Scot Fitzgerald  
Department Organic, Volatiles

**Group #**

WSCF121424

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
trans-1,2-Dichloroethene	156-60-5	24		ug/L	97.9	75 - 125				11/09/12
cis-1,2-Dichloroethene	156-59-2	25		ug/L	99.4	75 - 125				11/09/12
<b>MS</b>										
<b>QC Sample #84703</b>										
<b>Original 121404001</b>										
1,1-Dichloroethene	75-35-4	22		ug/L	86.6	75 - 125				11/09/12
Trichloroethene	79-01-6	25		ug/L	98.6	75 - 125				11/09/12
Benzene	71-43-2	27		ug/L	106.2	75 - 125				11/09/12
Toluene	108-88-3	26		ug/L	105.1	75 - 125				11/09/12
Chlorobenzene	108-90-7	26		ug/L	104.6	75 - 125				11/09/12
1,1-Dichloroethane	75-34-3	25		ug/L	98.5	75 - 125				11/09/12
Ethylbenzene	100-41-4	27		ug/L	108.6	75 - 125				11/09/12
1,2-Dichloroethane	107-06-2	27		ug/L	108.5	75 - 125				11/09/12
1,1,1-Trichloroethane	71-55-6	25		ug/L	101.8	75 - 125				11/09/12
Carbon disulfide	75-15-0	20		ug/L	81.8	75 - 125				11/09/12
1,1,2-Trichloroethane	79-00-5	28		ug/L	111.1	75 - 125				11/09/12
trans-1,2-Dichloroethene	156-60-5	24		ug/L	96.2	75 - 125				11/09/12
cis-1,2-Dichloroethene	156-59-2	25		ug/L	100.6	75 - 125				11/09/12
<b>MSD</b>										
<b>QC Sample #84704</b>										
<b>Original 121404001</b>										
<b>Paired 84703</b>										
1,1-Dichloroethene	75-35-4	22		ug/L	86.8	75 - 125	0.20	20		11/09/12
Trichloroethene	79-01-6	24		ug/L	96.6	75 - 125	2.00	20		11/09/12
Benzene	71-43-2	26		ug/L	103.6	75 - 125	2.50	20		11/09/12
Toluene	108-88-3	26		ug/L	102.6	75 - 125	2.50	20		11/09/12

\* - QC result out of range

n/a - Not Applicable

**Quality Control Report****DECEMBER 10, 2012**Attention Scot Fitzgerald  
Department Organic, Volatiles**Group #**

WSCF121424

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Chlorobenzene	108-90-7	26	ug/L	102.7	75 - 125	1.80	20			11/09/12
1,1-Dichloroethane	75-34-3	25	ug/L	98.8	75 - 125	0.30	20			11/09/12
Ethylbenzene	100-41-4	27	ug/L	106.1	75 - 125	2.30	20			11/09/12
1,2-Dichloroethane	107-06-2	27	ug/L	107.9	75 - 125	0.50	20			11/09/12
1,1,1-Trichloroethane	71-55-6	25	ug/L	98.4	75 - 125	3.40	20			11/09/12
Carbon disulfide	75-15-0	20	ug/L	81.2	75 - 125	0.70	20			11/09/12
1,1,2-Trichloroethane	79-00-5	27	ug/L	109.2	75 - 125	1.70	20			11/09/12
trans-1,2-Dichloroethene	156-60-5	24	ug/L	97.2	75 - 125	1.00	20			11/09/12
cis-1,2-Dichloroethene	156-59-2	25	ug/L	101.3	75 - 125	0.70	20			11/09/12

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF121424

Analytical Batch 209929 (QC Batch: 209929) Test Anions by Ion Chromatography (Water)  
 Associated Samples 121424002

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>										
<b>QC Sample #84713</b>										
Fluoride	16984-48-8	<0.023	ug/mL					U		11/06/12
Chloride	16887-00-6	<0.058	ug/mL					U		11/06/12
Nitrite-N	NO2-N	<0.019	ug/mL					U		11/06/12
Nitrate-N	NO3-N	<0.019	ug/mL					U		11/06/12
Sulfate	14808-79-8	<0.11	ug/mL					U		11/06/12
<b>LCS</b>										
<b>QC Sample #84714</b>										
Fluoride	16984-48-8	1.00	ug/mL	101.1	90 - 110					11/06/12
Chloride	16887-00-6	1.98	ug/mL	100.1	90 - 110					11/06/12
Nitrite-N	NO2-N	1.05	ug/mL	106.9	90 - 110					11/06/12
Nitrate-N	NO3-N	0.929	ug/mL	105	90 - 110					11/06/12
Sulfate	14808-79-8	4.11	ug/mL	104.8	90 - 110					11/06/12
<b>DUP</b>										
<b>QC Sample #84715</b>										
<b>Original 121410021</b>										
Fluoride	16984-48-8	0.232	ug/mL			1.60	20	D		11/06/12
Chloride	16887-00-6	15.7	ug/mL			1.70	20	D		11/06/12
Nitrite-N	NO2-N	<0.038	ug/mL			21.10	20	* UD		11/06/12
Nitrate-N	NO3-N	7.08	ug/mL			1.60	20	D		11/06/12

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
 Department Inorganic

Group #

WSCF121424

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Sulfate	14808-79-8	36.4	ug/mL				1.10	20	D	11/06/12
<b>MS</b>										
<b>QC Sample #84716</b>										
<b>Original 121410021</b>										
Fluoride	16984-48-8	1.00	ug/mL	100.5	80 - 120				D	11/06/12
Chloride	16887-00-6	1.91	ug/mL	95.7	80 - 120				D	11/06/12
Nitrite-N	NO2-N	0.959	ug/mL	97	80 - 120				D	11/06/12
Nitrate-N	NO3-N	0.880	ug/mL	98.4	80 - 120				D	11/06/12
Sulfate	14808-79-8	4.14	ug/mL	104.6	80 - 120				D	11/06/12
<b>MSD</b>										
<b>QC Sample #84717</b>										
<b>Original 121410021</b>										
<b>Paired 84716</b>										
Fluoride	16984-48-8	1.02	ug/mL	102.4	80 - 120	1.50	20		D	11/06/12
Chloride	16887-00-6	1.92	ug/mL	95.8	80 - 120	0.00	20		D	11/06/12
Nitrite-N	NO2-N	0.959	ug/mL	97.1	80 - 120	0.00	20		D	11/06/12
Nitrate-N	NO3-N	0.884	ug/mL	98.8	80 - 120	0.00	20		D	11/06/12
Sulfate	14808-79-8	3.97	ug/mL	100.2	80 - 120	0.40	20		D	11/06/12

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
 Department Radiochemistry

Group # WSCF121424

Analytical Batch 209939 (QC Batch: 209915) Test TC99 by Liquid Scintillation  
 Associated Samples 121424003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>										<b>QC Sample #84679</b>
Technetium-99										U 11/11/12
<b>LCS</b>										<b>QC Sample #84680</b>
Technetium-99	14133-76-7	0.70		pCi/L						11/11/12
<b>DUP</b>										<b>QC Sample #84681</b>
Technetium-99										Original 121411014
<b>MS</b>										<b>QC Sample #84682</b>
Technetium-99										Original 121411014
Technetium-99	14133-76-7	950		pCi/L	109.4	75 - 125	5.30	20		11/11/12

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
 Department Radiochemistry

Group # WSCF121424

Analytical Batch 209945 (QC Batch: 209864) Test Tritium by LSC  
 Associated Samples 121424003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>										<b>QC Sample #84577</b>
Tritium LCS										pCi/L
										89
<b>QC Sample #84578</b>										
Tritium DUP										pCi/L
										3200
<b>QC Sample #84579</b>										
Original 121414001										
Tritium MS										pCi/L
										-62
<b>QC Sample #84580</b>										
Original 121414001										
Tritium										10028-17-8
										21000
										pCi/L
										100.4
										75 - 125
* - QC result out of range										n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
 Department Wet Chemistry

Group # WSCF121424

Analytical Batch 210122 (QC Batch: 210122) Test Total Alkalinity as mg/L CaCO<sub>3</sub> (Water)  
 Associated Samples 121424003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed	
<b>LCS</b>										<b>QC Sample #84826</b>	
Total Alkalinity as CaCO <sub>3</sub>	ALKALINITY	97	mg/L	97.4	80 - 120					11/12/12	
<b>DUP</b>										<b>QC Sample #84827</b>	
		<b>Original 121422001</b>									
Total Alkalinity as CaCO <sub>3</sub>	ALKALINITY	200	mg/L				0.00	20		11/12/12	
<b>LCS</b>										<b>QC Sample #84828</b>	
Total Alkalinity as CaCO <sub>3</sub>	ALKALINITY	97	mg/L	97.3	80 - 120					11/12/12	
<b>LCS</b>										<b>QC Sample #84829</b>	
Total Alkalinity as CaCO <sub>3</sub>	ALKALINITY	97	mg/L	97.2	80 - 120					11/12/12	

\* - QC result out of range

n/a - Not Applicable

**Quality Control Report****DECEMBER 10, 2012**Attention Scot Fitzgerald  
Department Radiochemistry**Group #** WSCF121424**Analytical Batch** 210915 (QC Batch: 210239)      **Test** Strontium 89/90 (GPC/GEA)  
**Associated Samples** 121424003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>										<b>QC Sample #84908</b>
Strontium-89_90										SR-RAD -0.65 pCi/L U 12/04/12
<b>LCS</b>										<b>QC Sample #84909</b>
Strontium-89_90										SR-RAD 92 pCi/L 104 80 - 120 12/04/12
<b>DUP</b>										<b>QC Sample #84910</b>
										Original 121411001
Strontium-89_90	SR-RAD	-1.3	pCi/L				-57.90	20	*	U 12/04/12

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF121424

Analytical Batch 210924 (QC Batch: 210826) Test ICP-2008 MS All possible metal  
 Associated Samples 121424003, 121424004

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>										<b>QC Sample #85610</b>
Aluminum	7429-90-5		<5.0	ug/L				U		11/29/12
Silver	7440-22-4		<0.050	ug/L				U		11/29/12
Antimony	7440-36-0		<0.30	ug/L				U		11/29/12
Barium	7440-39-3		<0.20	ug/L				U		11/29/12
Beryllium	7440-41-7		<0.10	ug/L				U		11/29/12
Cadmium	7440-43-9		<0.050	ug/L				U		11/29/12
Chromium	7440-47-3		<0.10	ug/L				U		11/29/12
Cobalt	7440-48-4		<0.050	ug/L				U		11/29/12
Copper	7440-50-8		<0.10	ug/L				U		11/29/12
Lead	7439-92-1		<0.050	ug/L				U		11/29/12
Molybdenum	7439-98-7		<0.050	ug/L				U		11/29/12
Thallium	7440-28-0		<0.050	ug/L				U		11/29/12
Tin	7440-31-5		<0.050	ug/L				U		11/29/12
Arsenic	7440-38-2		<0.20	ug/L				U		11/29/12
Selenium	7782-49-2		<1.0	ug/L				U		11/29/12
<b>LCS</b>										<b>QC Sample #85611</b>

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF121424

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Aluminum	7429-90-5	401	ug/L	100.2	85 - 115					11/29/12
Silver	7440-22-4	41.3	ug/L	103.2	85 - 115					11/29/12
Antimony	7440-36-0	40.5	ug/L	101.3	85 - 115					11/29/12
Barium	7440-39-3	41.1	ug/L	102.6	85 - 115					11/29/12
Beryllium	7440-41-7	39.2	ug/L	98.1	85 - 115					11/29/12
Cadmium	7440-43-9	40.1	ug/L	100.3	85 - 115					11/29/12
Chromium	7440-47-3	40.0	ug/L	100	85 - 115					11/29/12
Cobalt	7440-48-4	40.2	ug/L	100.4	85 - 115					11/29/12
Copper	7440-50-8	40.0	ug/L	100	85 - 115					11/29/12
Lead	7439-92-1	42.2	ug/L	105.4	85 - 115					11/29/12
Molybdenum	7439-98-7	41.5	ug/L	103.8	85 - 115					11/29/12
Thallium	7440-28-0	41.6	ug/L	104.1	85 - 115					11/29/12
Tin	7440-31-5	41.4	ug/L	103.6	85 - 115					11/29/12
Arsenic	7440-38-2	39.5	ug/L	98.7	85 - 115					11/29/12
Selenium	7782-49-2	36.8	ug/L	92	85 - 115					11/29/12
<b>MS</b>		<b>QC Sample #85612</b>								
		<b>Original 121411010</b>								
Aluminum	7429-90-5	414	ug/L	103.6	70 - 130					11/29/12
Silver	7440-22-4	41.1	ug/L	102.7	70 - 130					11/29/12
Antimony	7440-36-0	40.1	ug/L	100.2	70 - 130					11/29/12
Barium	7440-39-3	40.8	ug/L	101.9	70 - 130					11/29/12
Beryllium	7440-41-7	41.7	ug/L	104.3	70 - 130					11/29/12
Cadmium	7440-43-9	39.5	ug/L	98.8	70 - 130					11/29/12

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
Department Inorganic

Group #

WSCF121424

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Chromium	7440-47-3	41.0	ug/L	102.6	70 - 130					11/29/12
Cobalt	7440-48-4	41.4	ug/L	103.5	70 - 130					11/29/12
Copper	7440-50-8	41.3	ug/L	103.2	70 - 130					11/29/12
Lead	7439-92-1	42.0	ug/L	105.1	70 - 130					11/29/12
Molybdenum	7439-98-7	40.8	ug/L	102	70 - 130					11/29/12
Thallium	7440-28-0	41.6	ug/L	103.9	70 - 130					11/29/12
Tin	7440-31-5	40.6	ug/L	101.6	70 - 130					11/29/12
Arsenic	7440-38-2	39.3	ug/L	98.4	70 - 130					11/29/12
Selenium	7782-49-2	36.5	ug/L	91.2	70 - 130					11/29/12
<b>MSD</b>		<b>QC Sample #85613</b>								
		<b>Original 121411010</b>						<b>Paired 85612</b>		
Aluminum	7429-90-5	414	ug/L	103.6	70 - 130	0.00	20			11/29/12
Silver	7440-22-4	41.4	ug/L	103.6	70 - 130	0.90	20			11/29/12
Antimony	7440-36-0	40.6	ug/L	101.6	70 - 130	1.30	20			11/29/12
Barium	7440-39-3	41.4	ug/L	103.6	70 - 130	1.60	20			11/29/12
Beryllium	7440-41-7	40.2	ug/L	100.5	70 - 130	3.70	20			11/29/12
Cadmium	7440-43-9	40.1	ug/L	100.2	70 - 130	1.40	20			11/29/12
Chromium	7440-47-3	40.8	ug/L	102	70 - 130	0.50	20			11/29/12
Cobalt	7440-48-4	40.8	ug/L	102	70 - 130	1.50	20			11/29/12
Copper	7440-50-8	40.8	ug/L	102.1	70 - 130	1.10	20			11/29/12
Lead	7439-92-1	42.2	ug/L	105.6	70 - 130	0.50	20			11/29/12
Molybdenum	7439-98-7	41.4	ug/L	103.4	70 - 130	1.40	20			11/29/12
Thallium	7440-28-0	41.9	ug/L	104.7	70 - 130	0.70	20			11/29/12

\* - QC result out of range

n/a - Not Applicable

**Quality Control Report****DECEMBER 10, 2012**Attention Scot Fitzgerald  
Department Inorganic**Group #**

WSCF121424

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Tin	7440-31-5	41.2	ug/L	103	70 - 130	1.40	20			11/29/12
Arsenic	7440-38-2	39.7	ug/L	99.2	70 - 130	0.90	20			11/29/12
Selenium	7782-49-2	36.0	ug/L	90.1	70 - 130	1.20	20			11/29/12

\* - QC result out of range      n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

Attention Scot Fitzgerald  
 Department Organic, Volatiles

Group # WSCF121424

Analytical Batch 209927 (QC Batch: 209925) Test SW-846 8260B Volatiles  
 Associated Samples 121424003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>SAMPLE</b>		<b>Sample #121424003</b>								
1,2-Dichloroethane-d4	17060-07-0				103.2	75 - 125				11/09/12
Toluene-d8	2037-26-5				95	75 - 125				11/09/12
4-Bromofluorobenzene	460-00-4				101.2	75 - 125				11/09/12
<b>BLANK</b>		<b>QC Sample #84701</b>								
1,2-Dichloroethane-d4	17060-07-0				98.1	75 - 125				11/09/12
Toluene-d8	2037-26-5				95.5	75 - 125				11/09/12
4-Bromofluorobenzene	460-00-4				100.8	75 - 125				11/09/12
<b>LCS</b>		<b>QC Sample #84702</b>								
1,2-Dichloroethane-d4	17060-07-0				100.8	75 - 125				11/09/12
Toluene-d8	2037-26-5				95.6	75 - 125				11/09/12
4-Bromofluorobenzene	460-00-4				97.4	75 - 125				11/09/12
<b>MS</b>		<b>QC Sample #84703</b> <b>Original 121404001</b>								
1,2-Dichloroethane-d4	17060-07-0				104.1	75 - 125				11/09/12

\* - QC result out of range

n/a - Not Applicable

**Quality Control Report****DECEMBER 10, 2012**Attention Scot Fitzgerald  
Department Organic, Volatiles**Group #** WSCF121424

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Toluene-d8	2037-26-5				93.4	75 - 125				11/09/12
4-Bromofluorobenzene	460-00-4				97.9	75 - 125				11/09/12
<b>MSD</b>										
<b>QC Sample #84704</b>										
<b>Original 121404001</b>										
1,2-Dichloroethane-d4	17060-07-0				102.4	75 - 125	n/a			11/09/12
Toluene-d8	2037-26-5				93.8	75 - 125	n/a			11/09/12
4-Bromofluorobenzene	460-00-4				97.2	75 - 125	n/a			11/09/12

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

DECEMBER 10, 2012

**Attention** Scot Fitzgerald  
**Department** Radiochemistry

**Group #** WSCF121424

**Analytical Batch** 210915 (QC Batch: 210239)      **Test** Strontium 89/90 (GPC/GEA)  
**Associated Samples** 121424003

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed	
<b>SAMPLE</b>		<b>Sample #121424003</b>									
Strontium Nitrate	10042-76-9			mg	76.9	25 - 105				12/04/12	
<b>BLANK</b>		<b>QC Sample #84908</b>									
Strontium Nitrate	10042-76-9			mg	71.1	25 - 105				12/04/12	
<b>LCS</b>		<b>QC Sample #84909</b>									
Strontium Nitrate	10042-76-9			mg	76.9	25 - 105				12/04/12	
<b>DUP</b>		<b>QC Sample #84910</b>									
		<b>Original 121411001</b>									
Strontium Nitrate	10042-76-9			mg	59.5	25 - 105	n/a			12/04/12	

\* - QC result out of range

n/a - Not Applicable

ATTACHMENT4

**SAMPLE RECEIPT**

Consisting of 5 pages  
Including cover page

**Waste Sampling and Characterization Facility**  
P.O. Box 1970 S3-30, Richland WA 99352  
Phone: (509) 373-7004/FAX: (509) 373-7134

## ACKNOWLEDGEMENT OF SAMPLES RECEIVED

**WSCF Laboratory**

PO Box 650 S3-30  
Richland, WA 99352

ATTN: Scot Fitzgerald

Customer Code: CHPRC

PO #: 401647

Work Order #: 121424

Profile #: I13-002-330

Proj. Mgr.:

Phone:

The following samples were received from you on 11/6/2012 3:15:00 PM. They have been scheduled for the tests listed beside each sample. If this information is incorrect, please contact your service representative. Thank you for using Waste Sampling and Characterization Facility.

Sample #	Sample ID	Matrix	Collected	Received
<b>Tests scheduled</b>				
121424001	B2MRW3	WATER CR6DA-W	11/6/2012 14:28	11/6/2012 15:15
121424002	B2MRW2	WATER IC-W	11/6/2012 14:28	11/6/2012 15:15
121424003	B2MRW1	WATER 2008-W; 8260V-W; ALK-W; H3-COL-W; SR89/90-W; TC99-W	11/6/2012 14:28	11/6/2012 15:15
121424004	B2MRW4	WATER 2008-W	11/6/2012 14:28	11/6/2012 15:15

**Test Acronym Description**

Test Acronym	Description
2008-W	ICP-MS (W)
8260V-W	Volatiles by 8260B (W)
ALK-W	Total Alkalinity (W)
CR6DA-W	Cr6 (W Discrete analyzer)
H3-COL-W	Tritium by EICHROM Column (W)
IC-W	Anions by IC (W)
SR89/90-W	Srtrontium 89/90 (GPC) (W)
TC99-W	Technetium-99 (W)

<b>CH2MHill Plateau Remediation Company</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>									
		<b>113-002-330</b>									
		Page 1 of 1									
<b>Collector</b>	<b>JANELLE ZUNKER</b>		<b>Contact/Requester</b>	Karen Waters-Husted		<b>Telephone No.</b>	376-4650		<b>Purchase Order/Charge Code</b>	300071ES20	
<b>SAF No.</b>	113-002		<b>Sampling Origin</b>	Hanford Site		<b>Ice Chest No.</b>	N/A		<b>Bill of Lading/Air Bill No.</b>	N/A	
<b>Project Title</b>	100KR(1) NOVEMBER 2012		<b>Logbook No.</b>	HNF-N-506 <u>22 / 23</u>		<b>Offsite Property No.</b>	N/A		<b>Total Activity Exemption:</b>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
<b>Shipped To (Lab)</b>	<b>Waste Sampling &amp; Characterization</b>		<b>Method of Shipment</b>	<b>GOVERNMENT VEHICLE</b>		<b>Hold Time</b>	Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
<b>Protocol</b>			<b>Priority:</b>	31 Days		<b>SPECIAL INSTRUCTIONS</b>					
<b>PRIORITY</b>											
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b>											
*** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR, but are not releasable per DOE Order 5400.5 (1990/1991).											
131424											
<b>Sample No.</b>	<b>Filter</b>	<b>*</b>	<b>Date</b>	<b>Time</b>	<b>No./Type Container</b>	<b>Sample Analysis</b>	<b>Holding Time</b>	<b>Preservative</b>	<b>Date/Time</b>	<b>Cool-4C</b>	
BAMRW3	I	N	W	11/16/12	10:28	1x500-mL aG	24 Hours				

Sample No.      Filter \*      Date      Time      No./Type Container      Sample Analysis      Holding Time      Preservative      Date/Time      Cool-4C

BAMRW3      I      N      W      11/16/12      10:28      1x500-mL aG      7196-CR6: Hexavalent Chromium (1)      24 Hours                          Cool-4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix *
JANELLE ZUNKER	<i>Janelle Zunker</i>	NOV 06 2012 1515	TA Frazee	Janelle Zunker		NOV 06 2012 1515		S = Soil SF = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time	Received By			Date/Time	DS = Dull Solids D = Dull Liquids T = Tissue W = Wine L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	

A-6004-B42 (REV 2)

PRINTED ON 10/10/2012

## Chain of Custody

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. #	113-002-329	Page 1 of 1
Collector	JANELLE ZUNKER	Contact/Requester	Karen Walters-Hosted	Telephone No.	376-4650	
SAF No.	113-002	Sampling Origin	Hanford Site	Purchase Order/Charge Code	300071ES20	
Project Title	100KR41(1) NOVEMBER 2012	Logbook No.	HNF-N-506 <u>72 / 73</u>	Ice Chest No.	N/A	
Method of Shipment	GOVERNMENT VEHICLE			Bill of Lading/Air Bill No.	N/A	
Priority:	<b>31 Days</b>	<b>PRIORITY</b>		Offsite Property No.	N/A	
Shipped To (Lab)	Waste Sampling & Characterization	SPECIAL INSTRUCTIONS	Hold Time	Total Activity Exemption	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Protocol	CERCLA					
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b>		100 Area Generator Knowledge Information Form applies. The CACN for all analytical work at WSCF is 401647. FY12 and FY13 samples cannot be in the same SDG.				
Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Holding Time
B2MRW2	2	N	W/11-6-12	14:28	3000-mlP	48 Hours
						Preservative Cool~4C
Relinquished By	Print	Sign	Date/Time	Received By	Date/Time	Matrix *
JANELLE ZUNKER	<i>Janelle Zunker</i>	NOV 06 2012 15:15	TA 113-002-329 <i>Jane: J</i>	NOV 06 2012 15:15	113-002-329 <i>Jane: J</i>	S = Soil
Relinquished By		Date/Time	Received By	Date/Time	Received By	SE = Sediment
						SO = Solid
Relinquished By		Date/Time	Received By	Date/Time	Received By	SL = Sludge
						W = Wipe
Relinquished By		Date/Time	Received By	Date/Time	Received By	W = Water
						O = Oil
						A = Air
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Disposed By	Date/Time
PRINTED ON	10/10/2012					A-6004-B42 (REV 2)

# Sample Receipt

DECEMBER 10, 2012

## **Chain of Custody**

C.O.C. # <b>113-002-328</b>									
Page <b>1 of 1</b>									
<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>									
<b>Collector</b>	<b>JANELLE ZUNKER</b>		<b>Sampling Origin</b>	<b>Karen Waters-Husted</b>	<b>Telephone No.</b>	<b>376-4650</b>			
<b>SAP# No.</b>	<b>113-002</b>		<b>Sampling Site</b>	<b>Hanford Site</b>	<b>Purchase Order/Charge Code</b>	<b>300071 ES20</b>			
<b>Project Title</b>	<b>100K24(1) NOVEMBER 2012</b>		<b>Logbook No.</b>	<b>HNF-N-506 <u>42</u>/<u>23</u></b>	<b>Ice Chest No.</b>	<b>N/A</b>			
<b>Shipped To (Lab)</b>	<b>Waste Sampling &amp; Characterization</b>		<b>Method of Shipment</b>	<b>GOVERNMENT VEHICLE</b>	<b>BILL of Lading/Air Bill No.</b>	<b>N/A</b>			
<b>Protocol</b>	<b>CERCLA</b>		<b>Priority:</b>	<b>PRIORITY 31 Days</b>	<b>Offsite Property No.</b>	<b>N/A</b>			
<b>Possible Sample Hazards/Remarks</b>									
*** Contains Radioactive Material at concentrations that are not regulated for transportation per 49 CFR but are not releasable per DOE Order 5400.5 (1990/7/99).									
<b>Sample No</b>	<b>Filter</b>	<b>Date</b>	<b>Time</b>	<b>No/Type Container</b>	<b>Sample Analysis</b>	<b>Holding Time</b>	<b>Preservative</b>		
B2MRW1 <b>3</b>	N	W	11-6-12	1525	200.8_METALS_JCPMS: DURA LIST (10)	6 Months	HNO3 to pH <2		
B2MRW1	N	W			2320_ALKALINITY_Alkalinity (1)	14 Days	COO<4C		
B2MRW1	V	W			8260_VOA_GCMS: List2 (25)	14 Days	HCl or H2SO4 to pH <2/Cool<4C		
B2MRW1	V	W			3x40-mL Ags*	6 Months	HNO3 to pH <2		
B2MRW1	V	W			Strontium-89_90 -- Total Sr	6 Months	HCl to pH <2		
B2MRW1	N	W			T099_3MDSK_LSC: Tc-99 (1)	6 Months	None		
B2MRW1	N	W			TRITIUM_EIE_LSC: Tritium (1)	6 Months			
B2MRW1	V	W				6 Months			
B2MRW4 <b>4</b>	V	W	V	1x500-mL G/P	200.8_METALS_JCPMS: DURA LIST (10)	6 Months	HNO3 to pH <2		
<b>Relinquished By</b>	<b>JANELLE ZUNKER</b>		<b>Print</b>	<b>Print</b>	<b>Sign</b>	<b>Date/Time</b>	<b>Matrix *</b>		
<b>Relinquished By</b>			<b>NOV 06 2012 15:15</b>	<b>Received By</b>	<b>TAFAZI, TAN JESUS, JR.</b>	<b>NOV 06 2012 15:15</b>	<b>S</b>	<b>Soil</b>	<b>DS</b>
<b>Relinquished By</b>			<b>Date/Time</b>	<b>Received By</b>		<b>Date/Time</b>	<b>SE</b>	<b>Sediment</b>	<b>DS</b>
<b>Relinquished By</b>			<b>Date/Time</b>	<b>Received By</b>		<b>Date/Time</b>	<b>SO</b>	<b>Solid</b>	<b>DS</b>
<b>Relinquished By</b>			<b>Date/Time</b>	<b>Received By</b>		<b>Date/Time</b>	<b>SL</b>	<b>Sludge</b>	<b>DL</b>
<b>FINAL SAMPLE DISPOSITION</b>	Disposal Method (e.g. Return to customer, per lab procedure, used in process)								
<b>PRINTED O</b>	10/16/2012								
Disposed By _____ Date/Time _____									
A-6004-842 (REV 2) Date/Time									