

MAY 7, 2014

**WSCF Laboratory**

PO Box 650 S3-30  
Richland, WA 99352



May 7, 2014

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

Dear Scot Fitzgerald,

FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF140641

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 WSCF140641

- \* 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**

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Group # WSCF140641  
Data Deliverable Date 05/12/14

<b>SAF #</b>	<b>Sample ID</b>	<b>Sample #</b>	<b>Matrix</b>	<b>Sampled</b>	<b>Received</b>
S14-004	B2W902	140641001	WATER	04/08/14	04/08/14
S14-004	B2W901	140641002	WATER	04/08/14	04/08/14
S14-004	B2W829	140641003	WATER	04/08/14	04/08/14
S14-004	B2W830	140641004	WATER	04/08/14	04/08/14

ATTACHMENT 2

**NARRATIVE**

Consisting of 3 pages  
Including cover page

### Introduction

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

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

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

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

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

### Analytical Methodology for Requested Analyses

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

### Inorganic Comments

Attachment 2  
Narrative  
WSCF140641

**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):

- 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.

#### **Radiochemistry Comments**

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

#### **Tritium:**

- All applicable QC controls are within the established limits.

#### **Technetium-99:**

- All applicable QC controls are within the established limits.

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

ATTACHMENT 3

**ANALYTICAL RESULTS**

Consisting of 17 pages  
Including cover page

**WSCF ANALYTICAL RESULTS REPORT**

For

CH2M Hill Plateau Remediation

PO Box 1600  
Richland, WA 99352

Attention: Scot Fitzgerald

**Contract #** MOA-FH-CHPRC-2008  
**Group #** WSCF140641  
**Report Date** May 7, 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 # WSCF140641

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
231339	231339	2	BLANK	108598	BLANK		Anions by Ion Chromatography (Water)
231339	231339	3	LCS	108599	LCS		Anions by Ion Chromatography (Water)
231339	231339	4	MS	108600	B2W7B4(140640010MS)	140640010	Anions by Ion Chromatography (Water)
231339	231339	5	MSD	108601	B2W7B4(140640010MSD)	140640010	Anions by Ion Chromatography (Water)
231339	231339	8	SAMPLE	140641001	B2W902		Anions by Ion Chromatography (Water)
231339	231339	9	SAMPLE	140641001	B2W902		Anions by Ion Chromatography (Water)
231339	231339	10	SAMPLE	140641002	B2W901		Anions by Ion Chromatography (Water)
231339	231339	11	SAMPLE	140641002	B2W901		Anions by Ion Chromatography (Water)
232555	232561	4	BLANK	109661	BLANK		3E-2008 ICP-MS 3 Elements
232555	232561	5	LCS	109662	LCS		3E-2008 ICP-MS 3 Elements
232555	232561	7	MS	109663	B2W820(140622007MS)	140622007	3E-2008 ICP-MS 3 Elements
232555	232561	8	MSD	109664	B2W820(140622007MSD)	140622007	3E-2008 ICP-MS 3 Elements
232555	232561	20	SAMPLE	140641003	B2W829		3E-2008 ICP-MS 3 Elements
232555	232561	21	SAMPLE	140641004	B2W830		3E-2008 ICP-MS 3 Elements

## Batch QC List

Attention Scot Fitzgerald  
 Department Radiochemistry

Group # WSCF140641

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
231268	231735	1	BLANK	108585	BLANK		TC99 by Liquid Scintillation
231268	231735	2	LCS	108586	LCS		TC99 by Liquid Scintillation
231268	231735	4	DUP	108587	B2W820(140622007DUP)	140622007	TC99 by Liquid Scintillation
231268	231735	5	MS	108588	B2W820(140622007MS)	140622007	TC99 by Liquid Scintillation
231268	231735	13	SAMPLE	140641003	B2W829		TC99 by Liquid Scintillation
231268	231735	14	SAMPLE	140641004	B2W830		TC99 by Liquid Scintillation
231536	231866	1	BLANK	108680	BLANK		Tritium by LSC
231536	231866	2	LCS	108681	LCS		Tritium by LSC
231536	231866	3	SAMPLE	140641003	B2W829		Tritium by LSC
231536	231866	4	DUP	108682	B2W829(140641003DUP)	140641003	Tritium by LSC
231536	231866	5	MSPK	108683	B2W829(140641003MSP)		Tritium by LSC
231536	231866	6	SAMPLE	140641004	B2W830		Tritium by LSC

## Method Reference

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

**Group #** WSCF140641

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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.

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<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
<b>LA-533-410</b>	HEIS	200.8_METALS_ICPMS	Determination of Trace Elements in Waters and Waste by Inductively Coupled Plasma, Mass Spec.
	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

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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

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

**Group #** WSCF140641

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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.

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<b>LA-218-413</b>	Tritium By Ion Removal Using Eichrom Resin Columns (Prep)		
	N/A	PREP METHOD	
<b>LA-438-402</b>	Determination of Technetium-99 by RAD Disk Filtration & Liquid Scintillation Counting		
	N/A	PREP METHOD	
<b>LA-508-421</b>	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

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

## WSCF Analytical Results Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140641

Sample # 140641001  
 SAF# S14-004  
 Sample ID B2W902

Matrix WATER  
 Sampled 04/08/14  
 Received 04/08/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>04/08/14</b>										
<b>Anions by Ion Chromatography (Water)</b>										
Fluoride	16984-48-8	LA-533-410	BD	0.228		ug/mL	2	0.050	1.0	04/08/14
Chloride	16887-00-6	LA-533-410	D	48.1		ug/mL	2	0.12	0.80	04/08/14
Nitrite-N	NO2-N	LA-533-410	UD	<0.040		ug/mL	2	0.040	0.20	04/08/14
Nitrate-N	NO3-N	LA-533-410	D	85.7		ug/mL	10	0.20	1.0	04/08/14
Sulfate	14808-79-8	LA-533-410	D	290		ug/mL	10	1.1	5.5	04/08/14

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

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

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

## WSCF Analytical Results Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140641

Sample # 140641002  
 SAF# S14-004  
 Sample ID B2W901

Matrix WATER  
 Sampled 04/08/14  
 Received 04/08/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>04/08/14</b>										
<b>Anions by Ion Chromatography (Water)</b>										
Fluoride	16984-48-8	LA-533-410	BD	0.214		ug/mL	2	0.050	1.0	04/08/14
Chloride	16887-00-6	LA-533-410	D	48.5		ug/mL	2	0.12	0.80	04/08/14
Nitrite-N	NO2-N	LA-533-410	UD	<0.040		ug/mL	2	0.040	0.20	04/08/14
Nitrate-N	NO3-N	LA-533-410	D	85.0		ug/mL	10	0.20	1.0	04/08/14
Sulfate	14808-79-8	LA-533-410	D	288		ug/mL	10	1.1	5.5	04/08/14

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

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

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

## WSCF Analytical Results Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140641

Sample # 140641003  
 SAF# S14-004  
 Sample ID B2W829

Matrix WATER  
 Sampled 04/08/14  
 Received 04/08/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>ICPMS Prep 3-Elements (W)</b>										<b>04/30/14</b>
<b>3E-2008 ICP-MS 3 Elements</b>										
Uranium	7440-61-1	LA-505-412	D	5.02		ug/L	2	0.10	0.50	05/05/14

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

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

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

## WSCF Analytical Results Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140641

Sample # 140641004  
 SAF# S14-004  
 Sample ID B2W830

Matrix WATER  
 Sampled 04/08/14  
 Received 04/08/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>ICPMS Prep 3-Elements (W)</b>										<b>04/30/14</b>
<b>3E-2008 ICP-MS 3 Elements</b>										
Uranium	7440-61-1	LA-505-412	D	5.20		ug/L	2	0.10	0.50	05/05/14

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

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

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

## WSCF Analytical Results Report

Attention Scot Fitzgerald  
 Department Radiochemistry

Group # WSCF140641

Sample # 140641003  
 SAF# S14-004  
 Sample ID B2W829

Matrix WATER  
 Sampled 04/08/14  
 Received 04/08/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>TC99 by Liquid Scin. WATER/LIQUID PREP</b>										<b>04/10/14</b>
<b>TC99 by Liquid Scintillation</b>										
Technetium-99	14133-76-7	LA-508-421		8000	1600	pCi/L	1	6.6		04/11/14
<b>Tritium by LSC EICHROM WA/LIQ PREP</b>										<b>04/10/14</b>
<b>Tritium by LSC</b>										
Tritium	10028-17-8	LA-508-421		1200	340	pCi/L	1	310		04/15/14

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

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

o - LCS recovery outside established laboratory acceptance limits.

## WSCF Analytical Results Report

Attention Scot Fitzgerald  
 Department Radiochemistry

Group # WSCF140641

Sample # 140641004  
 SAF# S14-004  
 Sample ID B2W830

Matrix WATER  
 Sampled 04/08/14  
 Received 04/08/14

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>TC99 by Liquid Scin. WATER/LIQUID PREP</b>										<b>04/10/14</b>
<b>TC99 by Liquid Scintillation</b>										
Technetium-99	14133-76-7	LA-508-421		8500	1700	pCi/L	1	6.6		04/11/14
<b>Tritium by LSC EICHROM WA/LIQ PREP</b>										<b>04/10/14</b>
<b>Tritium by LSC</b>										
Tritium	10028-17-8	LA-508-421		1300	350	pCi/L	1	310		04/15/14

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

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

o - LCS recovery outside established laboratory acceptance limits.

## Quality Control Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140641

Analytical Batch 231339 (QC Batch: 231339) Test Anions by Ion Chromatography (Water)  
 Associated Samples 140641001, 140641002

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>		<b>QC Sample #108598</b>								
Fluoride	16984-48-8	<0.025		ug/mL					U	04/08/14
Chloride	16887-00-6	<0.060		ug/mL					U	04/08/14
Nitrite-N	NO2-N	<0.020		ug/mL					U	04/08/14
Nitrate-N	NO3-N	<0.020		ug/mL					U	04/08/14
Sulfate	14808-79-8	<0.11		ug/mL					U	04/08/14
<b>LCS</b>		<b>QC Sample #108599</b>								
Fluoride	16984-48-8	0.910		ug/mL	91.9	90 - 110				04/08/14
Chloride	16887-00-6	1.89		ug/mL	95.6	90 - 110				04/08/14
Nitrite-N	NO2-N	0.974		ug/mL	99.6	90 - 110				04/08/14
Nitrate-N	NO3-N	0.887		ug/mL	100.2	90 - 110				04/08/14
Sulfate	14808-79-8	3.86		ug/mL	98.4	90 - 110				04/08/14
<b>MS</b>		<b>QC Sample #108600</b>								
		<b>Original 140640010</b>								
Fluoride	16984-48-8	0.979		ug/mL	97.9	80 - 120			D	04/08/14
Chloride	16887-00-6	1.86		ug/mL	93.1	80 - 120			D	04/08/14
Nitrite-N	NO2-N	0.908		ug/mL	91.9	80 - 120			D	04/08/14
Nitrate-N	NO3-N	0.864		ug/mL	96.7	80 - 120			D	04/08/14

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140641

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Sulfate	14808-79-8		3.93	ug/mL	99.2	80 - 120			D	04/08/14
<b>MSD</b>			<b>QC Sample #108601</b>							
			<b>Original</b>	<b>140640010</b>				<b>Paired</b>	<b>108600</b>	
Fluoride	16984-48-8		0.934	ug/mL	93.4	80 - 120	4.20	20	D	04/08/14
Chloride	16887-00-6		1.96	ug/mL	97.8	80 - 120	1.20	20	D	04/08/14
Nitrite-N	NO2-N		0.933	ug/mL	94.5	80 - 120	2.80	20	D	04/08/14
Nitrate-N	NO3-N		0.945	ug/mL	105.7	80 - 120	2.80	20	D	04/08/14
Sulfate	14808-79-8		4.47	ug/mL	112.8	80 - 120	1.40	20	D	04/08/14

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

Attention Scot Fitzgerald  
 Department Radiochemistry

Group # WSCF140641

Analytical Batch 231735 (QC Batch: 231268) Test TC99 by Liquid Scintillation  
 Associated Samples 140641003, 140641004

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

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

Attention Scot Fitzgerald  
 Department Radiochemistry

Group # WSCF140641

Analytical Batch 231866 (QC Batch: 231536) Test Tritium by LSC  
 Associated Samples 140641003, 140641004

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>										
Tritium <b>LCS</b>	10028-17-8		-66	pCi/L					U	04/15/14
Tritium <b>DUP</b>	10028-17-8		3600	pCi/L	92.5	80 - 120				04/15/14
Tritium <b>MSPK</b>	10028-17-8	1200	1200	pCi/L			0.90	20		04/15/14
Tritium	10028-17-8		20000	pCi/L	93	75 - 125				04/15/14

\* - QC result out of range

n/a - Not Applicable

## Quality Control Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140641

Analytical Batch 232561 (QC Batch: 232555) Test 3E-2008 ICP-MS 3 Elements  
 Associated Samples 140641003, 140641004

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>										
			<b>QC Sample #109661</b>							
Uranium	7440-61-1		<0.050	ug/L					U	05/05/14
<b>LCS</b>										
			<b>QC Sample #109662</b>							
Uranium	7440-61-1		35.5	ug/L	88.8	85 - 115				05/05/14
<b>MS</b>										
			<b>QC Sample #109663</b>							
			<b>Original 140622007</b>							
Uranium	7440-61-1		35.9	ug/L	89.7	70 - 130				05/05/14
<b>MSD</b>										
			<b>QC Sample #109664</b>							
			<b>Original 140622007</b>							
			<b>Paired 109663</b>							
Uranium	7440-61-1		32.1	ug/L	80.1	70 - 130	10.20	20		05/05/14

\* - QC result out of range

n/a - Not Applicable

ATTACHMENT4

**SAMPLE RECEIPT**

Consisting of 6 pages  
Including cover page

## Sample Receipt

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

## ACKNOWLEDGEMENT OF SAMPLES RECEIVED

**WSCF Laboratory**

PO Box 650 S3-30  
 Richland, WA 99352

**ATTN:** Scot Fitzgerald

**Customer Code:** CHPRC  
**CA CN:** 401647  
**Work Order #:** 140641  
**Customer Work ID:** S14-004-353  
**Due Date:** 05/12/2014 **(R031)**

The following samples were received from you on 4/8/2014 2:15:00 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
140641001	B2W902	WATER	4/8/2014 13:14	4/8/2014 14:15
<b>Procedure</b>		<b>Compound List</b>		
Anions by Ion Chromatography (Water)		F,Cl,NO2,NO3,SO4		
Sample #	Sample ID	Matrix	Collected	Received
140641002	B2W901	WATER	4/8/2014 13:14	4/8/2014 14:15
<b>Procedure</b>		<b>Compound List</b>		
Anions by Ion Chromatography (Water)		F,Cl,NO2,NO3,SO4		
Sample #	Sample ID	Matrix	Collected	Received
140641003	B2W829	WATER	4/8/2014 13:14	4/8/2014 14:15
<b>Procedure</b>		<b>Compound List</b>		
3E-2008 IC P-MS 3 Elements		U		
TC99 by Liquid Scintillation		Tc-99		
Tritium by LSC		H3		
Sample #	Sample ID	Matrix	Collected	Received
140641004	B2W830	WATER	4/8/2014 13:14	4/8/2014 14:15
<b>Procedure</b>		<b>Compound List</b>		
3E-2008 IC P-MS 3 Elements		U		
TC99 by Liquid Scintillation		Tc-99		
Tritium by LSC		H3		



Sample Receipt

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #  
S14-004-352  
Page 1 of 1

Collector	JANELLE ZUNGER	Contact/Requester	Karen Waters-Husted	Telephone No.	509-375-4650
SAF No.	S14-004	Sampling Origin	Hanford Site	Purchase Order/Charge Code	300071ESS20
Project Title	SURV, APRIL 2014	Logbook No.	HNF-N-506 <i>66/3</i>	Ice Check No.	N/A
Shipped To (Lab)	Waste Sampling & Characterization	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	SURV	Priority	31 Days <b>PRIORITY</b>	Offsite Property No.	N/A
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b>			<b>SPECIAL INSTRUCTIONS</b>		
** ** Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.			Hold Time		
			Site Wide Generator Knowledge Information Form applies		
			The CACN for analytical work at WSCF is 401647.		
Sample No.	Filter	Date	Time	No. Type Container	Sample Analysis
B2W9C1	N	4/6/14	134	1x500-mL P	300 0 JANONS J.C. COMMON
					48 Hours
					Preservative
					Cool-4C

Chain of Custody

Relinquished By	Final Sign	Date/Time	Received By	Prime Sign	Date/Time
JANELLE ZUNGER	<i>[Signature]</i>	APR 08 2014	KRISBY	<i>[Signature]</i>	APR 08 2014
Relinquished By	Sign	Date/Time	Received By	Sign	Date/Time
Relinquished By	Sign	Date/Time	Received By	Sign	Date/Time
Relinquished By	Sign	Date/Time	Received By	Sign	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time	Disposed By	Date/Time

MATRIX \*

S	= Soil	NS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SD	= Solid	T	= Tissue
SL	= Sludge	WI	= Waste
W	= Water	L	= Liquid
C	= Cell	V	= Volatile
A	= Air	X	= Other

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Sample Receipt

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # S14-004-266  
Page 1 of 1

Collector	JANELLE ZIMMER	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	S14-004	Sampling Origin	Hanford Site	Purchase Order/Charge Code	300071ESS20
Project Title	SURV, APRIL 2014	Logbook No.	HNF-N-506-040/3	ke Chest No.	N/A
Shipped To (Lab)	Waste Sampling & Characterization	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	SURV	Priority	31 Days	Offsite Property No.	N/A
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b>			<b>SPECIAL INSTRUCTIONS</b>		
** ** Contact Radiactive Material at concentrations that may or may not be replated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 438.1.			Size Wide Generator Knowledge Information Form applies. The CACN for analytical work at WSCF is 40/647.		
Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			Hold Time		

Sample No.	Filter	Date	Time	Nc/Type Container	Sample Analysis	Holding Time	Preservative
B2W829	N	4/8/14	134	1x500-mL G/P	200.9_METALS_ICPMS, Uranium (1)	6 Months	HNO3 to pH <2
B2W829	N	W	W	1x1-L G/P	TC99_3MDSK_LSC: COMMON	6 Months	HCl to pH <2
B2W829	N	W	L	1x250-mL G	TRITIUM_CIC_LSC: COMMON	6 Months	None

Chain of Custody

Relinquished By	JANELLE ZIMMER	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	<i>Janelle Zimmer</i>			APR 08 2014 2:04 PM	<i>KG Riebel</i>			APR 08 2014 1:49 PM
Relinquished By								
Relinquished By								
Relinquished By								
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)							
Disposed By								

MATRIX \*

S	=	Soil	DS	=	Dryn Solids
SE	=	Sediment	L	=	Liquids
SO	=	Solid	T	=	Tissue
SL	=	Sludge	W1	=	Wipe
W	=	Water	V	=	Vial
O	=	Oil	X	=	Other
A	=	Air			

PRINTED ON 3/12/2014

A 6004 942 (REV 2)

