

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 WSCF140719**

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 WSCF140719

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

Very truly yours,

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

Electronically signed by Joseph Hale

For Lab Manager, Dan T. Smith

WSCF Analytical Lab

(509) 373-4804

Attachments 4

CC: w/Attachments

File/LB

May 14, 2014

ATTACHMENT 1

**COVER SHEET**

Consisting of 2 pages  
Including cover page

**WSCF SAF Number Cross Reference**

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Group # WSCF140719  
 Data Deliverable Date 05/22/14

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
X14-028	B2W6H0	140719001	WATER	04/21/14	04/21/14
X14-028	B2W6H2	140719002	WATER	04/21/14	04/21/14
X14-028	B2W6L7	140719003	WATER	04/21/14	04/21/14
X14-028	B2W6L8	140719004	WATER	04/21/14	04/21/14
X14-028	B2W6M1	140719005	WATER	04/21/14	04/21/14
X14-028	B2W6M2	140719006	WATER	04/21/14	04/21/14
X14-028	B2W6L5	140719007	WATER	04/21/14	04/21/14
X14-028	B2W6L6	140719008	WATER	04/21/14	04/21/14
X14-028	B2W6F9	140719009	WATER	04/21/14	04/21/14

ATTACHMENT 2

**NARRATIVE**

Consisting of 3 pages  
Including cover page

### Introduction

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

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

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

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

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

### Analytical Methodology for Requested Analyses

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

### Inorganic Comments

Attachment 2  
Narrative  
WSCF140719

**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.

**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.

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 20 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 #** WSCF140719  
**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 # WSCF140719

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
232151	232151	2	BLANK	109256	BLANK		Anions by Ion Chromatography (Water)
232151	232151	3	LCS	109257	LCS		Anions by Ion Chromatography (Water)
232151	232151	4	MS	109258	B2W6L5(140719007MS)	140719007	Anions by Ion Chromatography (Water)
232151	232151	5	MSD	109259	B2W6L5(140719007MSD)	140719007	Anions by Ion Chromatography (Water)
232151	232151	8	SAMPLE	140719007	B2W6L5		Anions by Ion Chromatography (Water)
232151	232151	9	SAMPLE	140719009	B2W6F9		Anions by Ion Chromatography (Water)
232152	232152	2	BLANK	109261	BLANK		Anions by Ion Chromatography (Water)
232152	232152	3	LCS	109262	LCS		Anions by Ion Chromatography (Water)
232152	232152	4	MS	109263	B2W6L6(140719008MS)	140719008	Anions by Ion Chromatography (Water)
232152	232152	5	MSD	109264	B2W6L6(140719008MSD)	140719008	Anions by Ion Chromatography (Water)
232152	232152	6	SAMPLE	140719008	B2W6L6		Anions by Ion Chromatography (Water)
232153	232153	1	BLANK	109265	BLANK		Hexavalent chromium Discrete Analyzer
232153	232153	3	LCS	109267	LCS		Hexavalent chromium Discrete Analyzer
232153	232153	4	DUP	109268	B2W6L8(140719004DUP)	140719004	Hexavalent chromium Discrete Analyzer
232153	232153	5	MS	109269	B2W6L8(140719004MS)	140719004	Hexavalent chromium Discrete Analyzer
232153	232153	6	SAMPLE	140719004	B2W6L8		Hexavalent chromium Discrete Analyzer
232153	232153	13	SAMPLE	140719001	B2W6H0		Hexavalent chromium Discrete Analyzer
232153	232153	14	SAMPLE	140719002	B2W6H2		Hexavalent chromium Discrete Analyzer
232153	232153	15	SAMPLE	140719003	B2W6L7		Hexavalent chromium Discrete Analyzer
232153	232153	17	LCS	109271	LCS		Hexavalent chromium Discrete Analyzer
232153	232153	18	BLANK	109272	BLANK		Hexavalent chromium Discrete Analyzer
232153	232153	19	DUP	109273	B2W6M2(140719006DUP)	140719006	Hexavalent chromium Discrete Analyzer
232153	232153	20	MS	109274	B2W6M2(140719006MS)	140719006	Hexavalent chromium Discrete Analyzer

Batch QC List

Attention Scot Fitzgerald  
Department Inorganic

Group # WSCF140719

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
232153	232153	21	SAMPLE	140719006	B2W6M2		Hexavalent chromium Discrete Analyzer
232153	232153	22	SAMPLE	140719005	B2W6M1		Hexavalent chromium Discrete Analyzer

Method Reference

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140719

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-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 Inorganic

Group # WSCF140719

Sample # 140719001  
 SAF# X14-028  
 Sample ID B2W6H0

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

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>04/21/14</b>										
<b>Hexavalent chromium Discrete Analyzer</b>										
Hexavalent chromium	18540-29-9	LA-265-403		0.0213		mg/L	1	0.0020	0.0050	04/21/14

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

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

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

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140719

Sample # 140719002  
 SAF# X14-028  
 Sample ID B2W6H2

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

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>04/21/14</b>										
<b>Hexavalent chromium Discrete Analyzer</b>										
Hexavalent chromium	18540-29-9	LA-265-403		0.0210		mg/L	1	0.0020	0.0050	04/21/14

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

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

U - Analyzed for but not detected above limiting criteria.  
 X,Y or Z - See comment detail and/or narrative.  
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Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140719

Sample # 140719003  
 SAF# X14-028  
 Sample ID B2W6L7

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

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/21/14
<b>Hexavalent chromium Discrete Analyzer</b>										
Hexavalent chromium	18540-29-9	LA-265-403		0.0119		mg/L	1	0.0020	0.0050	04/21/14

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

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

U - Analyzed for but not detected above limiting criteria.  
 X,Y or Z - See comment detail and/or narrative.  
 PQL is equivalent to Estimated Quantitation Limit (EQL)  
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 Department Inorganic

Group # WSCF140719

Sample # 140719004  
 SAF# X14-028  
 Sample ID B2W6L8

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

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/21/14
<b>Hexavalent chromium Discrete Analyzer</b>										
Hexavalent chromium	18540-29-9	LA-265-403		0.0114		mg/L	1	0.0020	0.0050	04/21/14

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

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

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

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Group # WSCF140719

Sample # 140719005  
 SAF# X14-028  
 Sample ID B2W6M1

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

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/21/14
<b>Hexavalent chromium Discrete Analyzer</b>										
Hexavalent chromium	18540-29-9	LA-265-403		0.0127		mg/L	1	0.0020	0.0050	04/21/14

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

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

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

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140719

Sample # 140719006  
 SAF# X14-028  
 Sample ID B2W6M2

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

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										04/21/14
<b>Hexavalent chromium Discrete Analyzer</b>										
Hexavalent chromium	18540-29-9	LA-265-403		0.0124		mg/L	1	0.0020	0.0050	04/21/14

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

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

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

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140719

Sample # 140719007  
 SAF# X14-028  
 Sample ID B2W6L5

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

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>04/21/14</b>										
<b>Anions by Ion Chromatography (Water)</b>										
Fluoride	16984-48-8	LA-533-410	BD	0.167		ug/mL	2	0.050	1.0	04/21/14
Chloride	16887-00-6	LA-533-410	D	4.22		ug/mL	2	0.12	0.80	04/21/14
Nitrite-N	NO2-N	LA-533-410	UD	<0.040		ug/mL	2	0.040	0.20	04/21/14
Nitrate-N	NO3-N	LA-533-410	D	0.368		ug/mL	2	0.040	0.20	04/21/14
Sulfate	14808-79-8	LA-533-410	D	30.0		ug/mL	2	0.22	1.1	04/21/14

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

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

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

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140719

Sample # 140719008  
 SAF# X14-028  
 Sample ID B2W6L6

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

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>04/21/14</b>										
<b>Anions by Ion Chromatography (Water)</b>										
Fluoride	16984-48-8	LA-533-410	BD	0.125		ug/mL	2	0.050	1.0	04/21/14
Chloride	16887-00-6	LA-533-410	D	4.20		ug/mL	2	0.12	0.80	04/21/14
Nitrite-N	NO2-N	LA-533-410	UD	<0.040		ug/mL	2	0.040	0.20	04/21/14
Nitrate-N	NO3-N	LA-533-410	D	0.358		ug/mL	2	0.040	0.20	04/21/14
Sulfate	14808-79-8	LA-533-410	D	29.8		ug/mL	2	0.22	1.1	04/21/14

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

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

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

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140719

Sample # 140719009  
 SAF# X14-028  
 Sample ID B2W6F9

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

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>04/21/14</b>										
<b>Anions by Ion Chromatography (Water)</b>										
Fluoride	16984-48-8	LA-533-410	BD	0.131		ug/mL	2	0.050	1.0	04/21/14
Chloride	16887-00-6	LA-533-410	D	9.52		ug/mL	2	0.12	0.80	04/21/14
Nitrite-N	NO2-N	LA-533-410	UD	<0.040		ug/mL	2	0.040	0.20	04/21/14
Nitrate-N	NO3-N	LA-533-410	D	1.81		ug/mL	2	0.040	0.20	04/21/14
Sulfate	14808-79-8	LA-533-410	D	40.0		ug/mL	2	0.22	1.1	04/21/14

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

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

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

Quality Control Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140719

Analytical Batch 232151 (QC Batch: 232151) Test Anions by Ion Chromatography (Water)  
 Associated Samples 140719007, 140719009

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>		<b>QC Sample #109256</b>								
Fluoride	16984-48-8	<0.025		ug/mL					U	04/21/14
Chloride	16887-00-6	<0.060		ug/mL					U	04/21/14
Nitrite-N	NO2-N	<0.020		ug/mL					U	04/21/14
Nitrate-N	NO3-N	<0.020		ug/mL					U	04/21/14
Sulfate	14808-79-8	<0.11		ug/mL					U	04/21/14
<b>LCS</b>		<b>QC Sample #109257</b>								
Fluoride	16984-48-8	0.931		ug/mL	94.1	90 - 110				04/21/14
Chloride	16887-00-6	1.92		ug/mL	97.1	90 - 110				04/21/14
Nitrite-N	NO2-N	1.04		ug/mL	106.4	90 - 110				04/21/14
Nitrate-N	NO3-N	0.871		ug/mL	98.4	90 - 110				04/21/14
Sulfate	14808-79-8	3.97		ug/mL	101.3	90 - 110				04/21/14
<b>MS</b>		<b>QC Sample #109258</b>								
		<b>Original 140719007</b>								
Fluoride	16984-48-8	0.167	0.898	ug/mL	89.8	80 - 120			D	04/21/14
Chloride	16887-00-6	4.22	1.88	ug/mL	93.8	80 - 120			D	04/21/14
Nitrite-N	NO2-N	<0.040	0.982	ug/mL	99.4	80 - 120			D	04/21/14
Nitrate-N	NO3-N	0.368	0.880	ug/mL	98.4	80 - 120			D	04/21/14

\* - QC result out of range

n/a - Not Applicable



Quality Control Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140719

Analytical Batch 232152 (QC Batch: 232152) Test Anions by Ion Chromatography (Water)  
 Associated Samples 140719008

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>		<b>QC Sample #109261</b>								
Fluoride	16984-48-8	<0.025		ug/mL					U	04/21/14
Chloride	16887-00-6	<0.060		ug/mL					U	04/21/14
Nitrite-N	NO2-N	<0.020		ug/mL					U	04/21/14
Nitrate-N	NO3-N	<0.020		ug/mL					U	04/21/14
Sulfate	14808-79-8	<0.11		ug/mL					U	04/21/14
<b>LCS</b>		<b>QC Sample #109262</b>								
Fluoride	16984-48-8	0.971		ug/mL	98	90 - 110				04/21/14
Chloride	16887-00-6	1.88		ug/mL	94.7	90 - 110				04/21/14
Nitrite-N	NO2-N	1.04		ug/mL	106.4	90 - 110				04/21/14
Nitrate-N	NO3-N	0.854		ug/mL	96.5	90 - 110				04/21/14
Sulfate	14808-79-8	3.89		ug/mL	99.2	90 - 110				04/21/14
<b>MS</b>		<b>QC Sample #109263</b>								
		<b>Original 140719008</b>								
Fluoride	16984-48-8	0.125	0.892	ug/mL	89.2	80 - 120			D	04/21/14
Chloride	16887-00-6	4.20	1.85	ug/mL	92.7	80 - 120			D	04/21/14
Nitrite-N	NO2-N	<0.040	0.974	ug/mL	98.5	80 - 120			D	04/21/14
Nitrate-N	NO3-N	0.358	0.883	ug/mL	98.7	80 - 120			D	04/21/14

\* - QC result out of range

n/a - Not Applicable



Quality Control Report

Attention Scot Fitzgerald  
 Department Inorganic

Group # WSCF140719

Analytical Batch 232153 (QC Batch: 232153) Test Hexavalent chromium Discrete Analyzer  
 Associated Samples 140719001, 140719002, 140719003, 140719004, 140719005, 140719006

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>										
			<b>QC Sample #109265</b>							
Hexavalent chromium <b>LCS</b>	18540-29-9		<0.0020	mg/L					U	04/21/14
			<b>QC Sample #109267</b>							
Hexavalent chromium <b>DUP</b>	18540-29-9		0.0525	mg/L	105	90 - 110				04/21/14
			<b>QC Sample #109268</b>							
			<b>Original 140719004</b>							
Hexavalent chromium <b>MS</b>	18540-29-9	0.0114	0.0111	mg/L			2.70	20		04/21/14
			<b>QC Sample #109269</b>							
			<b>Original 140719004</b>							
Hexavalent chromium <b>LCS</b>	18540-29-9	0.0114	0.0422	mg/L	105.5	85 - 115				04/21/14
			<b>QC Sample #109271</b>							
Hexavalent chromium <b>BLANK</b>	18540-29-9		0.0525	mg/L	105	90 - 110				04/21/14
			<b>QC Sample #109272</b>							
Hexavalent chromium <b>DUP</b>	18540-29-9		<0.0020	mg/L					U	04/21/14
			<b>QC Sample #109273</b>							
			<b>Original 140719006</b>							
Hexavalent chromium	18540-29-9	0.0124	0.0122	mg/L			1.60	20		04/21/14

\* - QC result out of range

n/a - Not Applicable



ATTACHMENT4

**SAMPLE RECEIPT**

Consisting of 9 pages  
Including cover page

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

**ACKNOWLEDGEMENT OF SAMPLES RECEIVED**

**WSCF Laboratory**

PO Box 650 S3-30  
 Richland, WA 99352

**Customer Code:** CHPRC  
**CA CN:** 404438  
**Work Order #:** 140719  
**Customer Work ID:** X14-028-039  
**Due Date:** 05/22/2014 **(R031)**

**ATTN:** Scot Fitzgerald

The following samples were received from you on 4/21/2014 1:20:00 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
140719001	B2W6H0	WATER	4/21/2014 11:50	4/21/2014 13:20
<b>Procedure</b>		<b>Compound List</b>		
Hexavalent chromium Discrete Analyzer		C r6		
Sample #	Sample ID	Matrix	Collected	Received
140719002	B2W6H2	WATER	4/21/2014 11:50	4/21/2014 13:20
<b>Procedure</b>		<b>Compound List</b>		
Hexavalent chromium Discrete Analyzer		C r6		
Sample #	Sample ID	Matrix	Collected	Received
140719003	B2W6L7	WATER	4/21/2014 11:03	4/21/2014 13:20
<b>Procedure</b>		<b>Compound List</b>		
Hexavalent chromium Discrete Analyzer		C r6		
Sample #	Sample ID	Matrix	Collected	Received
140719004	B2W6L8	WATER	4/21/2014 11:03	4/21/2014 13:20
<b>Procedure</b>		<b>Compound List</b>		
Hexavalent chromium Discrete Analyzer		C r6		
Sample #	Sample ID	Matrix	Collected	Received
140719005	B2W6M1	WATER	4/21/2014 11:03	4/21/2014 13:20
<b>Procedure</b>		<b>Compound List</b>		
Hexavalent chromium Discrete Analyzer		C r6		
Sample #	Sample ID	Matrix	Collected	Received
140719006	B2W6M2	WATER	4/21/2014 11:03	4/21/2014 13:20
<b>Procedure</b>		<b>Compound List</b>		
Hexavalent chromium Discrete Analyzer		C r6		
Sample #	Sample ID	Matrix	Collected	Received
140719007	B2W6L5	WATER	4/21/2014 11:03	4/21/2014 13:20
<b>Procedure</b>		<b>Compound List</b>		
Anions by Ion Chromatography (Water)		F,Cl,NO2,NO3,SO4		
Sample #	Sample ID	Matrix	Collected	Received
140719008	B2W6L6	WATER	4/21/2014 11:03	4/21/2014 13:20
<b>Procedure</b>		<b>Compound List</b>		
Anions by Ion Chromatography (Water)		F,Cl,NO2,NO3,SO4		

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

Sample #	Sample ID	Matrix	Collected	Received
140719009	B2W6F9	WATER	4/21/2014 11:50	4/21/2014 13:20
Procedure		Compound List		
Anions by Ion Chromatography (Water)		F,Cl,NO2,NO3,SO4		

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #  
**X14-028-039**  
Page 1 of 1

Collector	Jean Aquilar	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	X14-028	Sampling Origin	Hanford Site	Purchase Order/Charge Code	302271ES20
Project Title	IBCS-ADD, APRIL 2014	Logbook No.	HNF-N-506 65 / 43	Ice Chest No.	N/A
Shipped To (Lab)	Waste Sampling & Characterization	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	CERCLA	Priority:	31 Days	Offsite Property No.	N/A

**POSSIBLE SAMPLE HAZARDS/REMARKS**  
 \*\*\* Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/DATA  
 Dangerous Goods Regulations but are not releasable per DOE Order 438.1.  
 1/10 719

Sample No.	Filter	Date	Time	No./Type Container	Sample Analysis	Holdings Time	Preservative
B2W6H0 001	N	4-21-14	1150	1X500-mL AG	7196_CRG: COMMON	24 Hours	Cool-4C
B2W6I2 002	Y	4-21-14	1150	1X500-mL AG	7196_CRG: COMMON	24 Hours	Cool-4C

Relinquished By	Date	Sign	Date/Time	Received By	Date/Time	Sign	Date/Time	Matrix *
Jean Aquilar	APR 21 2014	[Signature]	1320	KRISBY	APR 21 2014	[Signature]	1320	S = Soil SE = Sediment SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Linings I = I-Isotope WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time	Matrix *
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time	Matrix *
Relinquished By	Date/Time	Received By	Date/Time	Relinquished By	Date/Time	Received By	Date/Time	Matrix *

FINAL SAMPLE DISPOSITION Disposed Method (e.g. Return to customer, per lab procedure, used in process) Disposed By: [Signature] Date/Time: [Blank] Matrix: [Blank]

CH2MHILL Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #  
**X14-028-056**  
Page 1 of 1

Collector	<b>Joan Aguilar</b>	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	X14-028	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303271ES20
Project Title	IBC5-ADD, APRIL 2014	Logbook No.	HNF-N-506 65 / 43	Fee Check No.	N/A
Shipped To (Lab)	Waste Sampling & Characterization	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	CERCLA	Priority	31 Days	Offsite Property No.	N/A
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b>			<b>PRIORITY</b>		
*** Contaminative Material at concentrations that may or may not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 438.1			SPECIAL INSTRUCTIONS		
			**WPLJ S** 100 Area Generator Knowledge Information Form applies. The CACN for analytical work at WSCF is 400438.		
			Hold Time		
			Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		

Sample No.	Filter	Date	Time	No/Type Container	Sample Analysis	Hold Time	Preservative
B2WB1 003	N	W 4-21-14	1103	1x500-mL AG	7198_CRB_COMMON	24 Hours	Cool-4C
B2WB1 005	Y	W 4-21-14	1103	1x500-mL AG	7198_CRB_COMMON	24 Hours	Cool-4C

Chain of Custody

Relinquished By	<i>[Signature]</i>	Sign		Date/Time	APR 21 2014 1320	Received By	<i>[Signature]</i>	Sign		Date/Time	APR 21 2014 1320																																										
Relinquished By				Date/Time		Received By				Date/Time																																											
Relinquished By				Date/Time		Received By				Date/Time																																											
Relinquished By				Date/Time		Received By				Date/Time																																											
<table border="0"> <tr> <td>S</td><td>=</td><td>Soil</td> <td>DS</td><td>=</td><td>Drum Solids</td> </tr> <tr> <td>SE</td><td>=</td><td>Sediment</td> <td>DL</td><td>=</td><td>Drum Liquids</td> </tr> <tr> <td>SU</td><td>=</td><td>Solid</td> <td>T</td><td>=</td><td>Lissue</td> </tr> <tr> <td>SL</td><td>=</td><td>Sludge</td> <td>WI</td><td>=</td><td>Wipe</td> </tr> <tr> <td>W</td><td>=</td><td>Water</td> <td>L</td><td>=</td><td>Liquid</td> </tr> <tr> <td>O</td><td>=</td><td>Oil</td> <td>V</td><td>=</td><td>Vegetation</td> </tr> <tr> <td>A</td><td>=</td><td>Air</td> <td>X</td><td>=</td><td>Other:</td> </tr> </table>												S	=	Soil	DS	=	Drum Solids	SE	=	Sediment	DL	=	Drum Liquids	SU	=	Solid	T	=	Lissue	SL	=	Sludge	WI	=	Wipe	W	=	Water	L	=	Liquid	O	=	Oil	V	=	Vegetation	A	=	Air	X	=	Other:
S	=	Soil	DS	=	Drum Solids																																																
SE	=	Sediment	DL	=	Drum Liquids																																																
SU	=	Solid	T	=	Lissue																																																
SL	=	Sludge	WI	=	Wipe																																																
W	=	Water	L	=	Liquid																																																
O	=	Oil	V	=	Vegetation																																																
A	=	Air	X	=	Other:																																																
<b>FINAL SAMPLE DISPOSITION</b> Disposal Method (e.g., Return to customer, per lab procedure, used in process)																																																					
Disposed By: _____ Date/Time: _____																																																					

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A-5004-942 (REV 2)

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #  
**X14-028-059**  
Page 1 of 1

Collector	<i>Jean Hughes</i>	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	X144028	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303271ESS20
Project Title	IBC3-ADD, APRIL 2014	Logbook No.	HNF-N-506 45 / 43	Ice Check No.	N/A
Shipped To (Lab)	Waste Sampling & Characterization	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Product	CERCLA	Priority:	31 Days	Offsite Property No.	N/A
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b>			<b>SPECIAL INSTRUCTIONS</b>		
*** Contain Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/DATA Dangerous Goods Regulations but are not releasable per DOE Order 438.1.			**WHL 5** 100-Area Generator Knowledge Information Form applies. The CACN for analytical work at WSCF is 409438		
Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>			Hold Time		

Sample No.	Filter	*	Date	Time	No/Type Container	Sample Analysis	Holding Time	Preservative
B2V6L8 004	N	W	4-21-14	1103	1x500-mL aG	7196_C96: COMMON	24 Hours	Cool-4C
B2V6M2 006	Y	W	4-21-14	1103	1x500-mL aG	7196_C96: COMMON	24 Hours	Cool-4C

Relinquished By	<i>[Signature]</i>	Sign		Date/Time	APR 21 2014 1320	Received By	<i>[Signature]</i>	Sign		Date/Time	APR 21 2014 1320
Relinquished By				Date/Time		Received By				Date/Time	
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	Disposal Method (e.g., Return to customer, per lab procedure, used in process)					Disposed By				Date/Time	

- MATRIX \***
- S = Soil
  - SE = Sediment
  - SO = Solid
  - SL = Sludge
  - W = Water
  - O = Oil
  - A = Air
  - DS = Dried Solids
  - DL = Dried Liquids
  - T = Tissue
  - WT = Wipe
  - L = Liquid
  - V = Vegetation
  - X = Other

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A-6004-842 (REV 2)

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #  
**X14-028-055**  
Page 1 of 1

Collector	<b>Juan Aguilar</b>	Contact/Requester	Karen Waters-Husted	Telephone No.	509-375-4650
SAT No.	X14-028	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303271ESS20
Project Title	IBCS-ADD, APRIL 2014	Logbook No.	HNF-N-506 <u>LoS / 43</u>	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	CERCLA	Priority:	31 Days	Offsite Property No.	N/A
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b>		<b>PRIORITY</b>		Total Activity Exemption: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
<p>** If Contains Radioactive Material, it concentration that may or may not be regulated for transportation per 49 CFR/ATA Dangerous Goods Regulations but are not releasable per DOE Order 424.1.</p> <p>**W/ELLS** 100-Area Generator Knowledge Information Form applies. The CACN for analytical work at WSCF is 404438.</p>					
Sample No.	Filter	Date	No/Type Container	Sample Analysis	Preservative
BZW6L5	0c7	N	W	4-21-14	1103
				1X500-ML P	300.0 ANIONS_IC COMMON
				48 Hours	Cool-4C

Chain of Custody

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	MATRIX *
Juan Aguilar		-	APR 21 2014 1530	KEK/SBY		APR 21 2014	1530	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By	Date/Time	Received By	Date/Time	Received By	Date/Time	Received By	Date/Time	DS = Debris Solids DL = Debris Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Other
Relinquished By	Date/Time	Received By	Date/Time	Received 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			

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A-6004-942 (REV 2)



CH2M Hill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. #  
**X14-028-038**  
Page 1 of 1

Collector	<b>Jan Aguirre</b>	Contact/Requester	Karen Waters-Husted	Telephone No.	509-376-4650
SAF No.	X14-028	Sampling Origin	Hanford Site	Purchase Order/Charge Code	303271ESS20
Project Title	IBCS-ADD, APRIL 2014	Logbook No.	HNF-N-506 1.5 / 4.3	Ice Chest No.	N/A
Shipped To (Lab)	Waste Sampling & Characterization	Method of Shipment	GOVERNMENT VEHICLE	Bill of Lading/Air Bill No.	N/A
Protocol	CERCLA	Priority:	31 Days	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/49 T.A Dangerous Goods Regulations but are not releasable per DOE Order 438.1.			**WPLS** 100-Area Generator Knowledge Information Form applies. The CACN for analytical work at WSCF is 404438.		
Sample No.	Filter	Date	Time	Nc/Type Container	Sample Analysis
BZW6F9	OC <sup>3</sup>	N	W 4:21:14	1x500-mL P	300.0 ANIONS IC. COMMON
					48 Hours
					Preservative
					Cool-4C

Chain of Custody

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	MATRIX *
Jan Aguirre			APR 21 2014 13:20	K. Hasty			APR 21 2014 13:20	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air
Relinquished By			Date/Time	Received By			Date/Time	DS = Drum Solids DL = Drum Liquids T = Tissue WT = Waste L = Liquid V = Vegetation X = Other
Relinquished By			Date/Time	Received By			Date/Time	
Relinquished By			Date/Time	Received By			Date/Time	
FINAL SAMPLE DISPOSITION				Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Disposed By

PRINTED 0 3/4/2014

A-6004-812 (REV 2)