

WSCF Laboratory

RECEIVED MAY 19, 2011

PO Box 650 S3-30  
Richland, WA 99352



May 19, 2011

Michael Neely  
CH2M-HILL PRC  
PO Box 1600  
Richland, WA 99352

Dear Michael Neely,

FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF112146

Reference: (1) SOW, Mod 2, #36587, Release 3  
(2) HNF-SD-CD-QAPP-017, current version, Waste Sampling & Characterization Facility Quality Assurance Plan

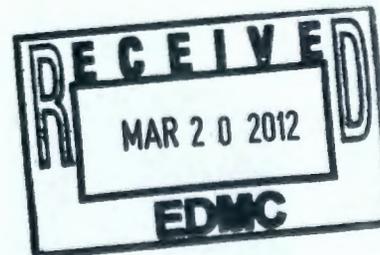
This letter contains the following information for sample delivery group WSCF112146

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

Very truly yours,

Electronically signed by Joseph Hale

For Lab Manager  
WSCF Analytical Lab  
(509) 373-7495



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 # WSCF112146  
Data Deliverable Date 05/09/11

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
F11-107	B2D798	112146001	WATER	05/02/11	05/02/11

ATTACHMENT 2

**NARRATIVE**

Consisting of 4 pages  
Including cover page

**Introduction**

A sample was received at the WSCF laboratory as referenced on the WSCF SAF Number Cross Reference table included in the final report. The sample was analyzed for the analytes indicated on the attached copy of the chain of custody (COC) form in accordance with the *Statement of Work (SOW), Modification No. 2 to Agreement 36587, Release 3, "FH 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, D, U and J) 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.
- **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.
- **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**

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

- All applicable QC controls are within the established limits.

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

- All applicable QC controls are within the established limits.

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

- Copper and Vanadium – Detected in the Blank and evaluated. Affected sample results in this batch were "C" Flagged.
- Strontium – Exceeded spiking levels by a factor of 4. Spike recoveries and associated RPDs are not valid.
- All other applicable QC controls are within the established limits.

**Organic Comments**

**Semi-VOA** – 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):

- Analysis performed by 8270-PAH SIM method.
- The Matrix Spike was lost during extraction. The Matrix Spike Duplicate was renamed as the Matrix Spike for reporting reasons. Sample Issue Resolution Form SDR11-260 was generated. The MSD was reported as the MS and the data was reported.
- All other 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.

<b>SAMPLE ISSUE RESOLUTION</b>	<b>SER NUM</b>	SDR11-288
	<b>REV NUM</b>	1
	<b>DATE INITIATED</b>	5/5/2011

**SAMPLE EVENT INFORMATION**

**SAP NUM(S)** F11-104, F11-107  
**OPERABLE UNIT(S)** 280-MG-1  
**PROJECT(S)** 280-MG-1  
**SAMPLE EVENT TITLE(S)** 280-MG-1 OU Waste Sites  
**LABORATORY** Waste Sampling & Characterization

**SAMPLING INFORMATION**

**NUMBER OF SAMPLES** 2  
**SAMPLE NUMBERS** B20798, B20795  
**SAMPLE MATRIX**  
**COLLECTION DATE** 5/2/2011 - 5/2/2011  
**SDS NUM** WSCF112146, WSCF112145

**ISSUE BACKGROUND**

**CLASS** Laboratory Issue  
**TYPE** Quality Control Failure  
**DESCRIPTION** The SVOCs were prepped and analyzed. Upon analytical data review, the MS sample had very abnormal results (abnormally low) indicating the MS sample had been lost during prep. The MSD, LCS, and surrogate recoveries were acceptable.

**DISPOSITION**

**DESCRIPTION** DO NOT REPORT THE MS, SINCE IT APPEARS TO NOT BE VALID MS DATA. REPORT THE MSD (AS A MS), THE LCS, AND BLANK AND NOTE IN THE NARRATIVE.  
**JUSTIFICATION** Submitted by: Heather Medley Date: 5/5/2011  
 Accepted by: Roy Bauer Date: 5/9/2011

ATTACHMENT 3

**ANALYTICAL RESULTS**

Consisting of 20 pages  
Including cover page

## WSCF ANALYTICAL RESULTS REPORT

For

CH2M Hill Plateau Remediation

PO Box 1600  
Richland, WA 99352

Attention: Michael Neely

**Contract #** MOA-FH-CHPRC-2008  
**Group #** WSCF112146  
**Report Date** May 19, 2011

**Analytical:** Electronically signed by Joseph Hale

**Client Services:** Electronically signed by Richard Barker

*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) 373-7022 or (509) 531-8004. Information designation of this report is the responsibility of the customer.

**Batch QC List**

Attention Michael Neely  
 Department Inorganic

Group # WSCF112146

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
181551	181554	4	BLANK	54653	BLANK		ICP-2008 MS All possible metal
181551	181554	5	LCS	54654	LCS		ICP-2008 MS All possible metal
181551	181554	6	MS	54655	B2CCB6(112108010MS)	112108010	ICP-2008 MS All possible metal
181551	181554	7	MSD	54656	B2CCB6(112108010MSD)	112108010	ICP-2008 MS All possible metal
181551	181554	31	SAMPLE	112146001	B2D798		ICP-2008 MS All possible metal
181574	181574	1	BLANK	54757	BLANK		Hexavalent chromium Discrete Analyzer
181574	181574	15	LCS	54763	LCS		Hexavalent chromium Discrete Analyzer
181574	181574	17	DUP	55067	B2CJ11(112149001DUP)	112149001	Hexavalent chromium Discrete Analyzer
181574	181574	18	MS	55068	B2CJ11(112149001MS)	112149001	Hexavalent chromium Discrete Analyzer
181574	181574	25	SAMPLE	112146001	B2D798		Hexavalent chromium Discrete Analyzer
181942	181943	1	BLANK	55573	BLANK		ICP-6010 - All possible metals
181942	181943	2	LCS	55574	LCS		ICP-6010 - All possible metals
181942	181943	3	MS	55575	B2CJN0(112011008MS)	112011008	ICP-6010 - All possible metals
181942	181943	4	MSD	55576	B2CJN0(112011008MSD)	112011008	ICP-6010 - All possible metals
181942	181943	16	SAMPLE	112146001	B2D798		ICP-6010 - All possible metals

**Batch QC List**

Attention Michael Neely  
Department Organic, Semivolatiles

Group # WSCF112146

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
181557	181712	1	BLANK	54678	BLANK		SW-846 8270D Semivolatiles (PAHSIM)
181557	181712	2	LCS	54679	LCS		SW-846 8270D Semivolatiles (PAHSIM)
181557	181712	3	MS	54680	B2D7B5(112145001MS)	112145001	SW-846 8270D Semivolatiles (PAHSIM)
181557	181712	5	SAMPLE	112146001	B2D798		SW-846 8270D Semivolatiles (PAHSIM)

## Method Reference

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Attention Michael Neely  
Department Inorganic

Group # WSCF112146

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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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LA-265-403	Hexavalent Chromium Analysis		
	EPA SW-846	7196A	Hexavalent Chromium
	HEIS	7196_CR6	Hexavalent Chromium
LA-505-411	Elemental Analysis by ICP Atomic Emission Spectroscopy (ICP AES)		
	EPA SW-846	6010C	Inductively Coupled Plasma-Atomic Emmision Spectrometry
	HEIS	6010_METALS_ICP	Inductively Coupled Plasma-Atomic Emmision Spectrometry
LA-505-412	Determination of Trace Elements in Waters & Wastes by ICP-Mass Spectrometry		
	EPA-600/R-94-111	200.8	Determination of Trace Elements in Waters and Waste by Inductively Coupled Plasma
	HEIS	200.8_METALS_ICPMS	Determination of Trace Elements in Waters and Waste by Inductively Coupled Plasma, Mass Spec.

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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 Michael Neely  
Department Organic, Semivolatiles

Group # WSCF112146

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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-523-456</b>	Semivolatile Sample Analysis by SW-846 Method 8270D		
	EPA SW-846	8000B	Determinative Chromagraphic Separations
	EPA SW-846	3510C	Separatory Funnel Liquid-Liquid Extraction
	EPA SW-846	8270D	Semivolatile Organic Compounds by Gas
	EPA SW-846	3545	Pressurized Fluid Extraction (PFE)
			Chromatography/Mass Spectrometry (GC/MS)
	HEIS	8270_SVOA_GCMS	Semivolatile Organic Compounds by Gas
			Chromatography/Mass Spectrometry(GC/MS)

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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 Michael Neely  
 Department Inorganic

Group # WSCF112146

Sample # 112146001  
 SAF# F11-107  
 Sample ID B2D798

Matrix WATER  
 Sampled 05/02/11  
 Received 05/02/11

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>Cr(VI)</b>										05/02/11
<b>Cr(VI)</b>										
Hexavalent chromium	18540-29-9	LA-265-403	U	<0.0020		mg/L	1	0.0020	0.0050	05/02/11
<b>ICP Prep</b>										05/16/11
<b>ICP-AES</b>										
Lithium	7439-93-2	LA-505-411	U	<4.0		ug/L	1	4.0	20	05/19/11
Boron	7440-42-8	LA-505-411	U	<41		ug/L	1	41	200	05/19/11
<b>ICPMS Prep</b>										05/03/11
<b>ICP-MS</b>										
Nickel	7440-02-0	LA-505-412	UD	<0.40		ug/L	2	0.40	4.0	05/03/11
Silver	7440-22-4	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/03/11
Antimony	7440-36-0	LA-505-412	UD	<0.60		ug/L	2	0.60	6.0	05/03/11
Barium	7440-39-3	LA-505-412	UD	<0.40		ug/L	2	0.40	4.0	05/03/11
Beryllium	7440-41-7	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/03/11
Cadmium	7440-43-9	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/03/11
Chromium	7440-47-3	LA-505-412	UD	<1.0		ug/L	2	1.0	10	05/03/11
Cobalt	7440-48-4	LA-505-412	UD	<0.10		ug/L	2	0.10	0.50	05/03/11
Copper	7440-50-8	LA-505-412	BDC	1.02		ug/L	2	0.20	2.0	05/03/11
Vanadium	7440-62-2	LA-505-412	BDC	0.474		ug/L	2	0.40	4.0	05/03/11

MDL = Minimum Detection  
 RQ = Result Qualifier  
 TP Err = Total Propagated  
 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)

**WSCF Analytical Results Report**

Attention Michael Neely  
 Department Inorganic

Group # WSCF112146

Sample # 112146001  
 SAF# F11-107  
 Sample ID B2D798

Matrix WATER  
 Sampled 05/02/11  
 Received 05/02/11

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Zinc	7440-66-6	LA-505-412	BD	7.51		ug/L	2	1.6	10	05/03/11
Lead	7439-92-1	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/03/11
Strontium	7440-24-6	LA-505-412	UD	<0.20		ug/L	2	0.20	2.0	05/03/11
Thallium	7440-28-0	LA-505-412	UD	<0.10		ug/L	2	0.10	1.0	05/03/11
Tin	7440-31-5	LA-505-412	BD	0.691		ug/L	2	0.10	1.0	05/03/11
Uranium	7440-61-1	LA-505-412	UD	<0.10		ug/L	2	0.10	0.40	05/03/11
Arsenic	7440-38-2	LA-505-412	UD	<0.80		ug/L	2	0.80	8.0	05/03/11
Selenium	7782-49-2	LA-505-412	UD	<0.60		ug/L	2	0.60	6.0	05/03/11

MDL = Minimum Detection  
 RQ = Result Qualifier  
 TP Err = Total Propagated  
 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)

**WSCF Analytical Results Report**

Attention Michael Neely  
 Department Organic, Semivolatiles

Group # WSCF112146

Sample # 112146001  
 SAF# F11-107  
 Sample ID B2D798

Matrix WATER  
 Sampled 05/02/11  
 Received 05/02/11

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
<b>8270 Prep</b>										<b>05/03/11</b>
<b>SW-846 8270D</b>										
Naphthalene	91-20-3	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Acenaphthylene	208-96-8	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Acenaphthene	83-32-9	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Fluorene	86-73-7	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Phenanthrene	85-01-8	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Anthracene	120-12-7	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Fluoranthene	206-44-0	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Pyrene	129-00-0	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Benzo(a)anthracene	56-55-3	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Chrysene	218-01-9	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Benzo(b)fluoranthene	205-99-2	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Benzo(k)fluoranthene	207-08-9	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Benzo(a)pyrene	50-32-8	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Indeno(1,2,3-cd)pyrene	193-39-5	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Dibenzo(a,h)anthracene	53-70-3	LA-523-456	U	<1		ug/L	1	1	4	05/04/11
Benzo(g,h,i)perylene	191-24-2	LA-523-456	U	<1		ug/L	1	1	4	05/04/11

MDL = Minimum Detection  
 RQ = Result Qualifier  
 TP Err = Total Propagated  
 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 < lowest calibration but >= MDL.  
 N - Presumed evidence based on MS library search(GC/MS only)

T - MS/MSD recovery outside control limits(GC/MS only).  
 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)

# Quality Control Report

Attention Michael Neely  
 Department Organic, Semivolatiles

Group # WSCF112146

QC Batch 181557 Test SW-846 8270D Semivolatiles (PAHSIM)  
 Associated Samples 112146001

Analyte	CAS #	Original Found	QC Found	Units	% Recov Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>		<b>QC Sample #54678</b>							
Naphthalene	91-20-3	<1		ug/L				U	05/04/11
Acenaphthylene	208-96-8	<1		ug/L				U	05/04/11
Acenaphthene	83-32-9	<1		ug/L				U	05/04/11
Fluorene	86-73-7	<1		ug/L				U	05/04/11
Phenanthrene	85-01-8	<1		ug/L				U	05/04/11
Anthracene	120-12-7	<1		ug/L				U	05/04/11
Fluoranthene	206-44-0	<1		ug/L				U	05/04/11
Pyrene	129-00-0	<1		ug/L				U	05/04/11
Benzo(a)anthracene	56-55-3	<1		ug/L				U	05/04/11
Chrysene	218-01-9	<1		ug/L				U	05/04/11
Benzo(b)fluoranthene	205-99-2	<1		ug/L				U	05/04/11
Benzo(k)fluoranthene	207-08-9	<1		ug/L				U	05/04/11
Benzo(a)pyrene	50-32-8	<1		ug/L				U	05/04/11
Indeno(1,2,3-cd)pyrene	193-39-5	<1		ug/L				U	05/04/11
Dibenzo(a,h)anthracene	53-70-3	<1		ug/L				U	05/04/11
Benzo(g,h,i)perylene	191-24-2	<1		ug/L				U	05/04/11
<b>LCS</b>		<b>QC Sample #54679</b>							

**Quality Control Report**

Attention Michael Neely  
 Department Organic, Semivolatiles

Group # WSCF112146

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Naphthalene	91-20-3		24	ug/L	80.5	59 - 113				05/04/11
Acenaphthene	83-32-9		25	ug/L	84.1	60 - 115				05/04/11
Fluorene	86-73-7		27	ug/L	90	61 - 116				05/04/11
Anthracene	120-12-7		27	ug/L	88.4	30 - 140				05/04/11
Pyrene	129-00-0		24	ug/L	80.3	56 - 135				05/04/11
Benzo(a)pyrene	50-32-8		26	ug/L	86.5	44 - 148				05/04/11
<b>MS</b>			<b>QC Sample #54680</b>							
			<b>Original 112145001</b>							
Naphthalene	91-20-3		26	ug/L	88.9	64 - 112				05/04/11
Acenaphthene	83-32-9		26	ug/L	87.6	62 - 116				05/04/11
Fluorene	86-73-7		27	ug/L	91.6	65 - 112				05/04/11
Anthracene	120-12-7		26	ug/L	90.5	65 - 114				05/04/11
Pyrene	129-00-0		26	ug/L	89.2	67 - 123				05/04/11
Benzo(a)pyrene	50-32-8		27	ug/L	92.6	52 - 129				05/04/11

**Quality Control Report**

Attention Michael Neely  
 Department Inorganic

Group # WSCF112146

QC Batch 181574 Test Hexavalent chromium Discrete Analyzer  
 Associated Samples 112146001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>			<b>QC Sample #54757</b>							
Hexavalent chromium <b>LCS</b>	18540-29-9	<0.0020		mg/L					U	05/02/11
			<b>QC Sample #54763</b>							
Hexavalent chromium <b>DUP</b>	18540-29-9	0.0495		mg/L	99	90 - 110				05/02/11
			<b>QC Sample #55067</b>							
			<b>Original 112149001</b>							
Hexavalent chromium <b>MS</b>	18540-29-9	0.0783		mg/L			0.30	20		05/02/11
			<b>QC Sample #55068</b>							
			<b>Original 112149001</b>							
Hexavalent chromium	18540-29-9	0.0423		mg/L	105.8	85 - 115				05/02/11

**Quality Control Report**

Attention Michael Neely  
 Department Inorganic

Group # WSCF112146

QC Batch 181942 Test ICP-6010 - All possible metals  
 Associated Samples 112146001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>BLANK</b>		<b>QC Sample #55573</b>								
Lithium	7439-93-2		<4.0	ug/L					U	05/19/11
Boron	7440-42-8		<41	ug/L					U	05/19/11
<b>LCS</b>		<b>QC Sample #55574</b>								
Lithium	7439-93-2		558	ug/L	111.6	80 - 120				05/19/11
Boron	7440-42-8		1060	ug/L	106	80 - 120				05/19/11
<b>MS</b>		<b>QC Sample #55575</b>								
		<b>Original 112011008</b>								
Lithium	7439-93-2		535	ug/L	107	75 - 125				05/19/11
Boron	7440-42-8		1040	ug/L	103.5	75 - 125				05/19/11
<b>MSD</b>		<b>QC Sample #55576</b>								
		<b>Original 112011008</b>								
		<b>Paired 55575</b>								
Lithium	7439-93-2		523	ug/L	104.6	75 - 125	2.30	20		05/19/11
Boron	7440-42-8		1020	ug/L	102.5	75 - 125	1.00	20		05/19/11

**Quality Control Report**

Attention Michael Neely  
 Department Inorganic

Group # WSCF112146

QC Batch 181551 Test ICP-2008 MS All possible metal  
 Associated Samples 112146001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #54653								
Nickel	7440-02-0	<0.20		ug/L					U	05/03/11
Silver	7440-22-4	<0.10		ug/L					U	05/03/11
Antimony	7440-36-0	<0.30		ug/L					U	05/03/11
Barium	7440-39-3	<0.20		ug/L					U	05/03/11
Beryllium	7440-41-7	<0.10		ug/L					U	05/03/11
Cadmium	7440-43-9	<0.10		ug/L					U	05/03/11
Chromium	7440-47-3	<0.50		ug/L					U	05/03/11
Cobalt	7440-48-4	<0.050		ug/L					U	05/03/11
Copper	7440-50-8	0.102		ug/L					B	05/03/11
Vanadium	7440-62-2	0.220		ug/L					B	05/03/11
Zinc	7440-66-6	<0.80		ug/L					U	05/03/11
Lead	7439-92-1	<0.10		ug/L					U	05/03/11
Strontium	7440-24-6	<0.10		ug/L					U	05/03/11
Thallium	7440-28-0	<0.050		ug/L					U	05/03/11
Tin	7440-31-5	<0.050		ug/L					U	05/03/11
Uranium	7440-61-1	<0.050		ug/L					U	05/03/11
Arsenic	7440-38-2	<0.40		ug/L					U	05/03/11
Selenium	7782-49-2	<0.30		ug/L					U	05/03/11

# Quality Control Report

Attention Michael Neely  
 Department Inorganic

Group # WSCF112146

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>LCS</b>		<b>QC Sample #54654</b>								
Nickel	7440-02-0		36.1	ug/L	90.2	85 - 115				05/03/11
Silver	7440-22-4		40.3	ug/L	100.7	85 - 115				05/03/11
Antimony	7440-36-0		38.8	ug/L	96.9	85 - 115				05/03/11
Barium	7440-39-3		39.3	ug/L	98.3	85 - 115				05/03/11
Beryllium	7440-41-7		36.0	ug/L	89.9	85 - 115				05/03/11
Cadmium	7440-43-9		38.5	ug/L	96.2	85 - 115				05/03/11
Chromium	7440-47-3		40.3	ug/L	100.8	85 - 115				05/03/11
Cobalt	7440-48-4		39.0	ug/L	97.5	85 - 115				05/03/11
Copper	7440-50-8		37.0	ug/L	92.6	85 - 115				05/03/11
Vanadium	7440-62-2		39.6	ug/L	98.9	85 - 115				05/03/11
Zinc	7440-66-6		37.8	ug/L	94.5	85 - 115				05/03/11
Lead	7439-92-1		39.9	ug/L	99.7	85 - 115				05/03/11
Strontium	7440-24-6		39.8	ug/L	99.6	85 - 115				05/03/11
Thallium	7440-28-0		38.4	ug/L	95.9	85 - 115				05/03/11
Tin	7440-31-5		40.4	ug/L	100.9	85 - 115				05/03/11
Uranium	7440-61-1		40.4	ug/L	101	85 - 115				05/03/11
Arsenic	7440-38-2		38.0	ug/L	95	85 - 115				05/03/11
Selenium	7782-49-2		36.4	ug/L	91	85 - 115				05/03/11
<b>MS</b>		<b>QC Sample #54655</b>								
		<b>Original 112108010</b>								
Nickel	7440-02-0		32.8	ug/L	81.9	70 - 130				05/03/11
Silver	7440-22-4		37.7	ug/L	94.4	70 - 130				05/03/11
Antimony	7440-36-0		39.3	ug/L	98.2	70 - 130				05/03/11

# Quality Control Report

Attention Michael Neely  
 Department Inorganic

Group # WSCF112146

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Barium	7440-39-3		39.2	ug/L	98.1	70 - 130				05/03/11
Beryllium	7440-41-7		37.8	ug/L	94.4	70 - 130				05/03/11
Cadmium	7440-43-9		37.7	ug/L	94.2	70 - 130				05/03/11
Chromium	7440-47-3		38.1	ug/L	95.3	70 - 130				05/03/11
Cobalt	7440-48-4		36.2	ug/L	90.5	70 - 130				05/03/11
Copper	7440-50-8		32.7	ug/L	81.7	70 - 130				05/03/11
Vanadium	7440-62-2		37.7	ug/L	94.2	70 - 130				05/03/11
Zinc	7440-66-6		31.7	ug/L	79.2	70 - 130				05/03/11
Lead	7439-92-1		39.9	ug/L	99.8	70 - 130				05/03/11
Strontium	7440-24-6		39.7	ug/L	99.2	70 - 130			X	05/03/11
Thallium	7440-28-0		39.1	ug/L	97.7	70 - 130				05/03/11
Tin	7440-31-5		40.8	ug/L	102	70 - 130				05/03/11
Uranium	7440-61-1		42.2	ug/L	105.5	70 - 130				05/03/11
Arsenic	7440-38-2		39.0	ug/L	97.4	70 - 130				05/03/11
Selenium	7782-49-2		35.9	ug/L	89.8	70 - 130				05/03/11
<b>MSD</b>			<b>QC Sample #54656</b>							
			<b>Original</b>	<b>112108010</b>				<b>Paired</b>	<b>54655</b>	
Nickel	7440-02-0		33.8	ug/L	84.5	70 - 130	3.10	20		05/03/11
Silver	7440-22-4		38.0	ug/L	94.9	70 - 130	0.50	20		05/03/11
Antimony	7440-36-0		40.0	ug/L	99.9	70 - 130	1.70	20		05/03/11
Barium	7440-39-3		38.8	ug/L	97.1	70 - 130	1.00	20		05/03/11
Beryllium	7440-41-7		37.2	ug/L	93.1	70 - 130	1.40	20		05/03/11
Cadmium	7440-43-9		38.2	ug/L	95.4	70 - 130	1.30	20		05/03/11
Chromium	7440-47-3		39.5	ug/L	98.7	70 - 130	3.50	20		05/03/11
Cobalt	7440-48-4		37.1	ug/L	92.8	70 - 130	2.50	20		05/03/11

**Quality Control Report**

Attention Michael Neely  
 Department Inorganic

Group # WSCF112146

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Copper	7440-50-8		33.9	ug/L	84.6	70 - 130	3.50	20		05/03/11
Vanadium	7440-62-2		39.5	ug/L	98.8	70 - 130	4.80	20		05/03/11
Zinc	7440-66-6		32.9	ug/L	82.3	70 - 130	3.80	20		05/03/11
Lead	7439-92-1		39.9	ug/L	99.8	70 - 130	0.00	20		05/03/11
Strontium	7440-24-6		40.0	ug/L	100	70 - 130	0.80	20	X	05/03/11
Thallium	7440-28-0		39.0	ug/L	97.4	70 - 130	0.30	20		05/03/11
Tin	7440-31-5		40.7	ug/L	101.7	70 - 130	0.30	20		05/03/11
Uranium	7440-61-1		42.3	ug/L	105.6	70 - 130	0.10	20		05/03/11
Arsenic	7440-38-2		38.8	ug/L	97.1	70 - 130	0.30	20		05/03/11
Selenium	7782-49-2		36.2	ug/L	90.5	70 - 130	0.80	20		05/03/11

# Quality Control Report

Attention Michael Neely  
 Department Organic, Semivolatiles

Group # WSCF112146

QC Batch 181557 Test SW-846 8270D Semivolatiles (PAHSIM)  
 Associated Samples 112146001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
<b>SAMPLE</b>		<b>Sample #112146001</b>								
Nitrobenzene-d5	4165-60-0				81.3	25 - 144				05/04/11
2-Fluorobiphenyl	321-60-8				89.4	52 - 113				05/04/11
Terphenyl-d14	98904-43-9				94.5	63 - 132				05/04/11
<b>BLANK</b>		<b>QC Sample #54678</b>								
Nitrobenzene-d5	4165-60-0				62.8	25 - 144				05/04/11
2-Fluorobiphenyl	321-60-8				70.2	52 - 113				05/04/11
Terphenyl-d14	98904-43-9				72.9	63 - 132				05/04/11
<b>LCS</b>		<b>QC Sample #54679</b>								
Nitrobenzene-d5	4165-60-0				80.2	25 - 144				05/04/11
2-Fluorobiphenyl	321-60-8				86.4	52 - 113				05/04/11
Terphenyl-d14	98904-43-9				84.6	63 - 132				05/04/11
<b>MS</b>		<b>QC Sample #54680</b>								
		<b>Original 112145001</b>								
Nitrobenzene-d5	4165-60-0				80.4	25 - 144				05/04/11
2-Fluorobiphenyl	321-60-8				84.4	52 - 113				05/04/11
Terphenyl-d14	98904-43-9				85	63 - 132				05/04/11

# Analytical Comment Report

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Attention: Michael Neely

Group #

WSCF112146

112146001

B2D798

PAHSIM: The MS extract was lost during the solvent reduction process. The MSD was renamed to the MS to avoid LIMS processing problems.

## Quality Control Comments

Department Inorganic

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54655

B2CCB6(112108010MS)

**Analyte**

Strontium - ICP-2008 MS All possible metal

[1] X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.

54656

B2CCB6(112108010MSD)

**Analyte**

Strontium - ICP-2008 MS All possible metal

[1] X5: Sample concentration exceed spiking level by a factor of 4. Spike recoveries are not valid.

## Analytical Comment Report

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Attention: Michael Neely

Group #

WSCF112146

### Quality Control Comments

Department Organic, Semivolatiles

<b>54678</b>	<b>BLANK for HBN 181557</b>
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The MS extract was lost during the solvent reduction process. The MSD was renamed to the MS to avoid LIMS processing problems.

<b>54679</b>	<b>LCS for HBN 181557 [ORGP/1605]</b>
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PAHSIM: The MS extract was lost during the solvent reduction process. The MSD was renamed to the MS to avoid LIMS processing problems.

<b>54680</b>	<b>B2D7B5(112145001MS)</b>
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PAHSIM: The MS extract was lost during the solvent reduction process. The MSD was renamed to the MS to avoid LIMS processing problems.

ATTACHMENT4

**SAMPLE RECEIPT**

Consisting of 4 pages  
Including cover page

Sample Receipt

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: Michael Neely

Customer Code: CHPRC  
PO #: 401352/ES20  
Work Order #: 112146  
Profile #: F11-107-001  
Proj. Mgr.:  
Phone:

The following samples were received from you on 5/2/2011 12:35:00 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>				
112146001	B2D798	WATER	5/2/2011 07:53	5/2/2011 12:35
<small>2008-W; 6010-W; CR6DA-W; PAHSIM-W</small>				

Test Acronym Description

Test Acronym	Description
2008-W	ICP-MS (W)
6010-W	ICP-AES (W)
CR6DA-W	Cr6 (W-Discrete analyzer)
PAHSIM-W	PAHSIM by 8270D SemiVOA (W)

Monday, May 02, 2011 3:49:33 PM  
Page 2 of 3

**CH2MHILL Plateau Remediation Company**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

F11-107-001      PAGE 1 OF 2

<p><b>COLLECTOR</b> <i>Scates</i></p> <p><b>SAMPLING LOCATION</b> 605-282 Ver F3 - 1</p> <p><b>ICE CHEST NO.</b></p> <p><b>SHIPPED TO</b> Waste Sampling &amp; Characterization</p> <p><b>MATRIX*</b> A-Air BL-Drum L-Liquid DS-Drum S-Solids L-Liquid D-Drum S-Solids SE-Sediment F-Fume V-Vaporization W-Water WI-Wipe Z-Other</p> <p><b>POSSIBLE SAMPLE HAZARDS/ REMARKS</b> Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not releasable per DOE Order 5400.5 (1990/1993)</p> <p><b>PRESERVATION</b> Cod-4C      H003 to pH &lt;2      Cod-4C 7/16 Days      6 Months      24 Hours</p> <p><b>HOLDING TIME</b></p> <p><b>TYPE OF CONTAINER</b> aG      GP      aG</p> <p><b>NO. OF CONTAINER(S)</b> 1      1      1</p> <p><b>VOLUME</b> L      500ml      500ml</p> <p><b>SPECIAL HANDLING AND/OR STORAGE</b></p> <p><b>SAMPLE ANALYSIS</b> WE FROM (I) IN SPECIAL INSTRUCTIONS      SEE FROM (D) IN SPECIAL INSTRUCTIONS      Check for 719C (Hexanes/Guthroom)</p>	<p><b>COMPANY CONTACT</b> BAUER, RG</p> <p><b>PROJECT DESIGNATION</b> ABRA Verification Sampling of the 600-282 Wood and Coal Debris Piles Site</p> <p><b>FIELD LOGBOOK NO.</b> <i>HANF-N-587-11</i></p> <p><b>OFFSITE PROPERTY NO.</b> N/A</p> <p><b>TELEPHONE NO.</b> 373-3931</p> <p><b>ACTUAL SAMPLE DEPTH</b> <i>N/A</i></p>	<p><b>PROJECT COORDINATOR</b> BAUER, RG</p> <p><b>SAF NO.</b> F11-107</p> <p><b>COA</b> 302222ES10</p> <p><b>BILL OF LADING/AIR BILL NO.</b> N/A</p> <p><b>PRICE CODE</b>      7B</p> <p><b>AIR QUALITY</b>      <input type="checkbox"/></p> <p><b>METHOD OF SHIPMENT</b> GOVERNMENT VEHICLE</p> <p><b>DATA TURNAROUND</b> 7 Days / 15 Days</p> <p style="text-align: center; font-size: 1.2em;"><b>ORIGINAL</b></p>
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SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	X	X	X
B20788	1 WATER	5-2-11	0753	X	X	X

**CHAIN OF POSSESSION**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	SIGN/ PRINT NAMES	DATE/TIME
<i>J. Scates</i>	5-2-11	<i>M. Nelson</i>	5/2/11 1235

**SPECIAL INSTRUCTIONS**  
SEE PAGE 2 FOR ALL SPECIAL INSTRUCTIONS

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME

**FINAL SAMPLE DISPOSITION**

**DISPOSER BY**      **DATE/TIME**

PRINTED ON 4/27/2011

A 6003 610 (REV 2)

Sample Receipt

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F11-107-001	PAGE 2 OF 2
COLLECTOR <i>Seales</i>	COMPANY CONTACT BAUER, RG	TELEPHONE NO. 373-3931	PROJECT COORDINATOR BAUER, RG	PRICE CODE 78	DATA TURNAROUND 7 Days / 15 Days
SAMPLING LOCATION 400-282 Ver EB - 1	PROJECT DESIGNATION ARRA Verification Sampling of the 600-282 Wood and Coal Debris Piles Site	FIELD LOGBOOK NO. <i>HNF-N-507-11</i>	ACTUAL SAMPLE DEPTH <i>N/A</i>	AIR QUALITY <input type="checkbox"/>	<b>ORIGINAL</b>
ICE CHEST NO.	OFFSITE PROPERTY NO. N/A	COA 302222F510	BILL OF LADING/AIR BILL NO. N/A	METHOD OF SHIPMENT GOVERNMENT VEHICLE	
SHIPPED TO Waste Sampling & Characterization					

**SPECIAL INSTRUCTIONS**

- \*\* The CACN for all analytical work at WSCF laboratory is 401352E520.
- \*\* The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
- \*\* The laboratory shall report only the requested constituents of concern in all final data reports, and EDDs. QC results for non-requested constituents need not be reported, but samples chosen for matrix spike, and all spike compounds shall be identified in the final data report case narrative. No TICs shall be reported.
- (1) Semi-VOA - 8270 (TCL) {Acenaphthene, Acenaphthylene, Anthracene, Benzo(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(ghi)perylene, Benzo(k)fluoranthene, Chrysene, Dibenz(a,h)anthracene, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, Pyrene};
- (2) ICP/MS - 200.8 (TAL) {Antimony, Barium, Cadmium, Chromium, Cobalt, Copper, Nickel, Silver, Vanadium, Zinc}; ICP/MS - 200.8 (Add-on) {Arsenic, Beryllium, Lead, Selenium, Strontium, Thallium, Tin, Uranium}; ICP Metals - 6010 (Add-On) {Boron, Lithium};

PRINTED ON 4/27/2011

A-6063-618 (REV 2)