

PO Box 1000 S3-30
Richland, WA 99352
(509) 373-7005
(509) 372-0456

Memorandum

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

Date: October 27, 2009

From: WSCF Laboratory
WSCF Analytical Chemistry

CC:

Subject: FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF91167

Reference: (1) SOW, Mod 2, #36587, Release 3
(2) HNF-SD-CD-QAPP-017, Rev 9, Waste Sampling & Characterization Facility Quality Assurance Plan

This letter contains the following information for sample delivery group WSCF91167

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

Electronically signed by Bill Baird
For Lab Manager

Attachments 4

RECEIVED
OCT 31 2009

EDMC

ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF Number Cross Reference

Group # WSCF91167
Data Deliverable Date 10/29/09

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
S09-009	B21KC2	91167001	WATER	09/29/09	09/29/09

ATTACHMENT 2

NARRATIVE

Consisting of 3 pages
Including cover page

Introduction

One (1) groundwater sample was received at the WSCF Laboratory on September 29, 2009. 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 stamped "ICED" by the WSCF Laboratory Sample Custodian during sample receiving, indicating the presence of ice in the transport container.

The following generic data qualifiers (i.e., B, D, 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 wetchem 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.

Analytical Methodology for Requested Analyses

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

Inorganic Comments

Anions – Hold time requirements for this analysis were met. A Duplicate, Matrix Spike, Matrix Spike Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- Batch QC analyzed on sample# B20PM6
- Nitrate - Duplicate is flagged for RPD out-of-limits. RPD does not apply to sample concentrations below the calibration range. RPD is calculated on measured values and not applicable for a result below the RDL.

All other 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 QC controls are within the established limits.

Radiochemistry Comments

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

All 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 12 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 # WSCF91167
Report Date October 27, 2009

Analytical: Electronically signed by Bill Baird

Client Services: Electronically signed by Richard Barker

All radiochemistry 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) 373-7020 or (509) 531-8004. Information designation of this report is the responsibility of the customer.

Batch QC List

Attention Michael Neely
 Department Inorganic

Group # WSCF91167

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
64640	64640	2	BLANK	15864	BLANK		Anions by Ion Chromatography (Water)
64640	64640	3	LCS	15865	LCS		Anions by Ion Chromatography (Water)
64640	64640	4	DUP	15866	B20PM6(91166002DUP)	91166002	Anions by Ion Chromatography (Water)
64640	64640	5	MS	15867	B20PM6(91166002MS)	91166002	Anions by Ion Chromatography (Water)
64640	64640	6	MSD	15868	B20PM6(91166002MSD)	91166002	Anions by Ion Chromatography (Water)
64640	64640	9	SAMPLE	91167001	B21KC2		Anions by Ion Chromatography (Water)
64645	64646	4	BLANK	15887	BLANK		ICP-2008 MS All possible metal
64645	64646	5	LCS	15888	LCS		ICP-2008 MS All possible metal
64645	64646	18	MS	15889	B21K03(91159001MS)	91159001	ICP-2008 MS All possible metal
64645	64646	19	MSD	15890	B21K03(91159001MSD)	91159001	ICP-2008 MS All possible metal
64645	64646	28	SAMPLE	91167001	B21KC2		ICP-2008 MS All possible metal

Batch QC List

Attention Michael Neely
Department Radiochemistry

Group # WSCF91167

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
65168	66043	1	BLANK	16397	BLANK		Gross Alpha/Gross Beta
65168	66043	2	LCS	16398	LCS		Gross Alpha/Gross Beta
65168	66043	3	SAMPLE	91167001	B21KC2		Gross Alpha/Gross Beta
65168	66043	4	SAMPLE	91167001	B21KC2		Gross Alpha/Gross Beta
65168	66043	5	DUP	16399	B21KC2(91167001DUP)	91167001	Gross Alpha/Gross Beta

Method Reference

Attention Michael Neely
Department Inorganic

Group # WSCF91167

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory, industry methods or HEIS methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

LA-505-412	Determination of Trace Elements in Waters & Wastes by ICP-Mass Spectrometry		
	EPA-600/R-94-111	200.8	Determination of Trace Elements in Waters and Waste by Inductively Coupled Plasma
	HEIS	200.8_METALS_ICPMS	Determination of Trace Elements in Waters and Waste by Inductively Coupled Plasma, Mass Spec.
LA-533-410	Anion Analysis by Ion Chromatography		
	EPA-600/R-94-111	300.0	Determination of Inorganic Anions by Ion Chromatography
	HEIS	300.0_ANIONS_IC	Determination of Inorganic Anions by Ion Chromatography

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

Method Reference

Attention Michael Neely
Department Radiochemistry

Group # WSCF91167

The results provided in this report were generated using the following WSCF Laboratory procedures. For your convenience, this table provides a listing of the regulatory, industry methods or HEIS methods that are referenced by each of these WSCF procedures. Please note that the most recent version of the regulatory or industry method is listed here even though WSCF procedure may reference an older version of the method. Also, a reference to a regulatory or industry method here does not necessarily indicate a verbatim implementation of that method.

LA-508-415	Operation Of The Protean 2-Inch Alpha/Beta Counting System For Gross Alpha/ Beta Samples	
HEIS	ALPHA_GPC	Gross Alpha by GPC
HEIS	BETA_GPC	Gross Beta by GPC
HEIS	SRTOT_SEP_PRECIP_GPC	Strontium beta isotopic, GPC

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 # WSCF91167

Sample # 91167001
 SAF# S09-009
 Sample ID B21KC2

Matrix WATER
 Sampled 09/29/09
 Received 09/29/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										09/29/09
Anions by IC										
Fluoride	16984-48-8	LA-533-410	BD	0.248		ug/mL	2	0.060	0.40	09/29/09
Chloride	16887-00-6	LA-533-410	D	13.1		ug/mL	2	0.086	0.80	09/29/09
Nitrite-N	NO2-N	LA-533-410	UD	<0.036		ug/mL	2	0.036	0.20	09/29/09
Nitrate-N	NO3-N	LA-533-410	D	8.62		ug/mL	2	0.062	0.20	09/29/09
Sulfate	14808-79-8	LA-533-410	D	58.5		ug/mL	2	0.13	2.0	09/29/09
ICPMS Prep										09/30/09
ICP-MS										
Uranium	7440-61-1	LA-505-412		12.6		ug/L	1	0.050	0.20	09/30/09

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

B - Analyte < the RDL 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 sample recovery outside control limits.

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

WSCF Analytical Results Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF91167

Sample # 91167001
SAF# S09-009
Sample ID B21KC2

Matrix WATER
Sampled 09/29/09
Received 09/29/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Alpha/Beta Prep										10/13/09
Gross Alpha/Beta										
Gross Alpha	12587-46-1	LA-508-415		6.6	3	pCi/L	1	3.6		10/26/09
Gross Beta	12587-47-2	LA-508-415		26	5.5	pCi/L	1	6.0		10/26/09

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
 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.

Quality Control Report

Attention Michael Neely
 Department Inorganic

Group # WSCF91167

QC Batch 64640 Test Anions by Ion Chromatography (Water)
 Associated Samples 91167001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #15864								
Fluoride	16984-48-8		<0.030	ug/mL					U	09/29/09
Chloride	16887-00-6		<0.043	ug/mL					U	09/29/09
Nitrite-N	NO2-N		<0.018	ug/mL					U	09/29/09
Nitrate-N	NO3-N		<0.031	ug/mL					U	09/29/09
Sulfate	14808-79-8		<0.066	ug/mL					U	09/29/09
LCS		QC Sample #15865								
Fluoride	16984-48-8		0.983	ug/mL	98.3	90 - 110				09/29/09
Chloride	16887-00-6		1.94	ug/mL	99.3	90 - 110				09/29/09
Nitrite-N	NO2-N		0.947	ug/mL	96.7	90 - 110				09/29/09
Nitrate-N	NO3-N		0.872	ug/mL	99	90 - 110				09/29/09
Sulfate	14808-79-8		3.87	ug/mL	98.8	90 - 110				09/29/09
DUP		QC Sample #15866								
		Original 91166002								
Fluoride	16984-48-8		0.584	ug/mL			1.90	20	D	09/29/09
Chloride	16887-00-6		3.34	ug/mL			0.60	20	D	09/29/09
Nitrite-N	NO2-N		<0.036	ug/mL			0.00	20	UD	09/29/09
Nitrate-N	NO3-N		<0.062	ug/mL			200.00	20	* UD	09/29/09
Sulfate	14808-79-8		6.33	ug/mL			0.20	20	D	09/29/09
MS		QC Sample #15867								
		Original 91166002								

Quality Control Report

Attention Michael Neely
 Department Inorganic

Group # WSCF91167

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Fluoride	16984-48-8		1.01	ug/mL	100.1	80 - 120			D	09/29/09
Chloride	16887-00-6		1.97	ug/mL	100.2	80 - 120			D	09/29/09
Nitrite-N	NO2-N		1.08	ug/mL	109.2	80 - 120			D	09/29/09
Nitrate-N	NO3-N		0.916	ug/mL	102.9	80 - 120			D	09/29/09
Sulfate	14808-79-8		3.92	ug/mL	98.9	80 - 120			D	09/29/09
MSD										
QC Sample #15868										
Original 91166002										
Paired 15867										
Fluoride	16984-48-8		1.08	ug/mL	107.4	80 - 120	7.00	20	D	09/29/09
Chloride	16887-00-6		2.05	ug/mL	103.9	80 - 120	3.60	20	D	09/29/09
Nitrite-N	NO2-N		1.12	ug/mL	113.1	80 - 120	3.50	20	D	09/29/09
Nitrate-N	NO3-N		0.925	ug/mL	103.9	80 - 120	1.00	20	D	09/29/09
Sulfate	14808-79-8		4.10	ug/mL	103.7	80 - 120	4.70	20	D	09/29/09

Quality Control Report

Attention Michael Neely
 Department Inorganic

Group # WSCF91167

QC Batch 64645 Test ICP-2008 MS All possible metal
 Associated Samples 91167001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			QC Sample #15887							
Uranium LCS	7440-61-1		<0.050	ug/L					U	09/30/09
			QC Sample #15888							
Uranium MS	7440-61-1		40.2	ug/L	100.4	85 - 115				09/30/09
			QC Sample #15889							
			Original 91159001							
Uranium MSD	7440-61-1		39.9	ug/L	99.8	70 - 130				09/30/09
			QC Sample #15890							
			Original 91159001						Paired 15889	
Uranium	7440-61-1		34.6	ug/L	86.5	70 - 130	14.30	20		09/30/09

Quality Control Report

Attention Michael Neely
 Department Radiochemistry

Group # WSCF91167

QC Batch 65168 Test Gross Alpha/Gross Beta
 Associated Samples 91167001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			QC Sample #16397							
Gross Alpha	12587-46-1		0.54	pCi/L					U	10/26/09
Gross Beta	12587-47-2		-1.5	pCi/L					U	10/26/09
LCS			QC Sample #16398							
Gross Alpha	12587-46-1		120	pCi/L	88.3	80 - 120				10/26/09
Gross Beta	12587-47-2		470	pCi/L	105.5	80 - 120				10/26/09
DUP			QC Sample #16399							
			Original 91167001							
Gross Alpha	12587-46-1	6.6	7.0	pCi/L			5.90	-20 - 20		10/26/09
Gross Beta	12587-47-2	26	26	pCi/L			0.00	-20 - 20		10/26/09

ATTACHMENT4

SAMPLE RECEIPT

Consisting of 3 pages
Including cover page

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

ACKNOWLEDGEMENT OF SAMPLES RECEIVED

WSCF Laboratory
 PO Box 1000 S3-30
 Richland, WA 99352

ATTN: Michael Neely

Customer Code: CHPRC
 PO #: 400637
 Work Order #: 91167
 Profile #: S09-009-177
 Proj. Mgr.:
 Phone:

The following samples were received from you on 9/29/2009 11:00:00 AM. 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
Tests scheduled				
91167001	B21KC2	WATER	9/29/2009 10:02	9/29/2009 11:00
2008-W; GAB-AO-W; GAB-BO-W; IC-W				

Test Acronym Description

Test Acronym	Description
2008-W	ICP-MS (W)
GAB-AO-W	Gross Alpha/Beta (A only)(W)
GAB-BO-W	Gross Alpha/Beta (B only)(W)
IC-W	Anions by IC (W)

CHPRC		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C.# 509-009-177	
				Page 1 of 1			
Collector: AR McIntyre		Contact/Requester Dana Widrig		Telephone No. MSIN FAX 509-376-2858			
SAF No. 509-009		Sampling Origin Landfill Site		Purchase Order/Invoice Code			
Project File SLURV SEPTEMBER 2009		HNF-N-508-21193		Ice Chest No. 6W-1		Temp.	
Shipped To Lab Waste Sampling & Characterization		Method of Shipment Truck Vehicle		Bill of Lading/Air Bill No.			
Protocol SLURV		Priority: 30 Days PRIORITY		Offsite Proceess No.			
POSSIBLE SAMPLE HAZARDS/REMARKS ** ** Contains Radioactive Material in concentrations that are not regulated for transportation per 49 CFR but are not releasable per DCF Order 5400 5 (1990/1997)				SPECIAL INSTRUCTIONS Hold time Site-Wide Generator Knowledge Information Form applies		Total Activity Exemption Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
91167							
Sample No	Lab ID	Date	Time	No/Type Container	Sample Analysis	Hold Time	Preservative
B21KC2	001	W	4:24:09	1x500-mL P	300_0_ANIONS_IC List-1 (5)	28 Days/48 Hours	Cool-4C
B21KC2		W		1x500-mL G/P	ALPHABETA_GPC: Alpha discrete + Beta (2) ALPHABETA_GPC: Alpha discrete + Beta (2)	5 Months	HNO3 to pH <2
B21KC2		W		1x500 mL G/P	200_8_METALS_ICPMS Uranium (1)	5 Months	HNO3 to pH <2
SEP 29 2009							
Relinquished By AR McIntyre		Date/Time SEP 29 2009 11:00		Received By A Frazier		Date/Time SEP 29 2009 11:00	
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	

Wednesday, September 30, 2009 1:07:43 AM

