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WSCF Laboratory

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Richland, WA 99352
(509) 373-7005
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Memorandum

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

Date: May 6, 2009

From: WSCF Laboratory
WSCF Analytical Chemistry

CC:

Subject: FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF90134

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 WCSF90134

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

Electronically signed by Scot Fitzgerald
For Lab Manager

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Attachments 4

ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF Number Cross Reference

Group # WSCF90134
Data Deliverable Date 04/12/09

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
F09-019	B1YRK8	90134001	WATER	02/26/09	02/26/09

ATTACHMENT 2

NARRATIVE

Consisting of 3 pages
Including cover page

Attachment 2
Narrative
WSCF90134

Introduction

One S&GRP sample was received at the WSCF Laboratory on February 26, 2009. 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* 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.

All 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):

- Calcium, Magnesium and Sodium – sample concentrations exceeded spiking levels by a factor of 4. Spike recoveries are not valid. Check standard was analyzed to ensure linearity for those sample results that were greater than the calibration standard.

Attachment 2
Narrative
WSCF90134

All other QC controls are within the established limits.

Radiochemistry Comments

Rad Chem – There are no hold times associated with WSCF's radiochemical methods. A Duplicate, Blank and Laboratory Control Sample were analyzed with this delivery group. Analytical Note(s):

- GEA (Bi-212 and Bi-214) – Blank result which was > MDA was evaluated and judged to be acceptable.
- GEA – Several Duplicate Relative Percent Differences (RPDs) exceeded established laboratory limits. The RPD criterion does not apply to results near or below the minimum detectable activity.
- Gross Alpha – Blank result was > MDA. Result was evaluated and there was no affect on sample results.
- Gross Beta – Duplicate RPD exceeded established laboratory limits. The RPD criterion does not apply to results near or below the minimum detectable activity.

All other 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 18 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 #	WSCF90134
Report Date	May 6, 2009

Analytical: Electronically signed by Scot Fitzgerald

Client Services: Electronically signed by Pauline Mix

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 # WSCF90134
Project Number F09-019

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
19599	19599	2	BLANK	4801	BLANK		Anions by Ion Chromatography (Water)
19599	19599	3	LCS	4802	LCS		Anions by Ion Chromatography (Water)
19599	19599	5	DUP	4803	B1YJJ1(90132001DUP)	90132001	Anions by Ion Chromatography (Water)
19599	19599	6	MS	4804	B1YJJ1(90132001MS)	90132001	Anions by Ion Chromatography (Water)
19599	19599	7	MSD	4805	B1YJJ1(90132001MSD)	90132001	Anions by Ion Chromatography (Water)
19599	19599	16	SAMPLE	90134001	B1YRK8		Anions by Ion Chromatography (Water)
21333	21736	1	BLANK	5727	BLANK		ICP-6010 - All possible metals
21333	21736	2	LCS	5728	LCS		ICP-6010 - All possible metals
21333	21736	13	MS	5729	B1Y8F6(90125003MS)	90125003	ICP-6010 - All possible metals
21333	21736	14	MSD	5730	B1Y8F6(90125003MSD)	90125003	ICP-6010 - All possible metals
21333	21736	18	SAMPLE	90134001	B1YRK8		ICP-6010 - All possible metals

Batch QC List

Attention Michael Neely
Department Radiochemistry

Group # WSCF90134
Project Number F09-019

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
20014	20101	1	IBLANK	4998	IBLANK		Gamma Energy Analysis-general
20014	20101	2	LCS	4999	LCS		Gamma Energy Analysis-general
20014	20101	3	DUP	5000	096266018(90154001DU	90154001	Gamma Energy Analysis-general
20014	20101	7	SAMPLE	90134001	B1YRK8		Gamma Energy Analysis-general
20531	21118	1	BLANK	5264	BLANK		Gross Alpha/Gross Beta
20531	21118	2	LCS	5265	LCS		Gross Alpha/Gross Beta
20531	21118	3	SAMPLE	90134001	B1YRK8		Gross Alpha/Gross Beta
20531	21118	4	SAMPLE	90134001	B1YRK8		Gross Alpha/Gross Beta
20531	21118	5	DUP	5266	B1YRK8(90134001DUP)	90134001	Gross Alpha/Gross Beta

Method Reference

Attention	Michael Neely	**Group #**	WSCF90134
Department	Inorganic	**Project Number**	F09-019

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-505-411	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-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.rl.gov/rapidweb/AS-DOL/index.cfm

Method Reference

Attention	Michael Neely	**Group #**	WSCF90134
Department	Radiochemistry	**Project Number**	F09-019

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
LA-508-481	Gamma Energy Analysis using the Canberra Genie Ssystem		
	HEIS	GAMMA_GS	Gamma Energy Analysis

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 # WSCF90134
Project Number F09-019

Sample # 90134001
SAF# F09-019
Sample ID B1YRK8

Matrix WATER
Sampled 02/26/09
Received 02/26/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Anions by IC										**02/26/09**
Anions by IC										
Fluoride	16984-48-8	LA-533-410	U	<0.023		ug/mL	1	0.023	0.20	02/26/09
Chloride	16887-00-6	LA-533-410	U	<0.047		ug/mL	1	0.047	0.40	02/26/09
Nitrite-N	NO2-N	LA-533-410	U	<0.013		ug/mL	1	0.013	0.10	02/26/09
Nitrate-N	NO3-N	LA-533-410	B	0.0442		ug/mL	1	0.012	0.10	02/26/09
Phosphate-P	PO4-P	LA-533-410	U	<0.061		ug/mL	1	0.061	0.40	02/26/09
Sulfate	14808-79-8	LA-533-410	U	<0.13		ug/mL	1	0.13	1.0	02/26/09
ICP Prep										**03/18/09**
ICP-AES										
Magnesium	7439-95-4	LA-505-411	U	<50		ug/L	1	50	250	03/25/09
Potassium	7440-09-7	LA-505-411	U	<170		ug/L	1	170	850	03/25/09
Sodium	7440-23-5	LA-505-411	B	152		ug/L	1	51	260	03/25/09
Calcium	7440-70-2	LA-505-411	B	137		ug/L	1	73	360	03/25/09

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 diltution 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 # WSCF90134
Project Number F09-019

Sample # 90134001
SAF# F09-019
Sample ID B1YRK8

Matrix WATER
Sampled 02/26/09
Received 02/26/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Alpha/Beta Prep										**03/16/09**
Gross Alpha/Beta										
Gross Alpha	12587-46-1	LA-508-415	U	0.090	.28	pCi/L	1	0.54		03/23/09
Gross Beta	12587-47-2	LA-508-415		1.5	.91	pCi/L	1	1.4		03/23/09
GEA Prep										**03/05/09**
GEA										
Americium-241	14596-10-2	LA-508-481	U	-87	35	pCi/L	1	51		03/09/09
Antimony-125	14234-35-6	LA-508-481	U	-1.1	13	pCi/L	1	22		03/09/09
Barium-133	13981-41-4	LA-508-481	U	1.9	6.8	pCi/L	1	11		03/09/09
Cerium-144	14762-78-8	LA-508-481	U	-33	34	pCi/L	1	54		03/09/09
Cerium/Praseodynium-144	CE/PR-144	LA-508-481	U	-67	68	pCi/L	1	110		03/09/09
Cesium-134	13967-70-9	LA-508-481	U	4.6	5.4	pCi/L	1	9.5		03/09/09
Cesium-137	10045-97-3	LA-508-481	U	2.0	5.1	pCi/L	1	8.9		03/09/09
Cobalt-60	10198-40-0	LA-508-481	U	-2.4	4.6	pCi/L	1	7.8		03/09/09
Europium-152	14683-23-9	LA-508-481	U	-15	15	pCi/L	1	24		03/09/09
Europium-154	15585-10-1	LA-508-481	U	3.2	13	pCi/L	1	23		03/09/09
Europium-155	14391-16-3	LA-508-481	U	-1.1	18	pCi/L	1	31		03/09/09
Niobium-94	14681-63-1	LA-508-481	U	-1.9	5.1	pCi/L	1	8.5		03/09/09
Potassium-40	13966-00-2	LA-508-481	U	-60	79	pCi/L	1	130		03/09/09

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.

WSCF Analytical Results Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF90134
Project Number F09-019

Sample # 90134001
SAF# F09-019
Sample ID B1YRK8

Matrix WATER
Sampled 02/26/09
Received 02/26/09

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Radium-226	13982-63-3	LA-508-481	U	22	17	pCi/L	1	24		03/09/09
Radium-228	15262-20-1	LA-508-481	U	-4.8	26	pCi/L	1	33		03/09/09
Ruthenium-106	13967-48-1	LA-508-481	U	40	49	pCi/L	1	87		03/09/09
Tin-126	15832-50-5	LA-508-481	U	-14	14	pCi/L	1	23		03/09/09
Thorium-234	15065-10-8	LA-508-481	U	-450	370	pCi/L	1	500		03/09/09
Uranium-235	15117-96-1	LA-508-481	U	-65	50	pCi/L	1	61		03/09/09
Zinc-65	13982-39-3	LA-508-481	U	-8.4	11	pCi/L	1	18		03/09/09
Actinium-228	14331-83-0	LA-508-481	U	-4.8	26	pCi/L	1	33		03/09/09
Bismuth-212	14913-49-6	LA-508-481	U	-22	40	pCi/L	1	66		03/09/09
Bismuth-214	14733-03-0	LA-508-481	U	22	17	pCi/L	1	24		03/09/09
Lead-212	15092-94-1	LA-508-481	U	-2.3	15	pCi/L	1	18		03/09/09
Lead-214	15067-28-4	LA-508-481		31	19	pCi/L	1	19		03/09/09
Ruthenium-103	13968-53-1	LA-508-481	U	-1.0	5.8	pCi/L	1	9.9		03/09/09
Tin-113	13966-06-8	LA-508-481	U	-1.8	6.3	pCi/L	1	11		03/09/09
Thallium-208	14913-50-9	LA-508-481		12	10	pCi/L	1	8.7		03/09/09
Beryllium-7	13966-02-4	LA-508-481	U	-0.22	52	pCi/L	1	78		03/09/09
Cobalt-57	13981-50-5	LA-508-481	U	1.6	4.4	pCi/L	1	7.4		03/09/09
Manganese-54	13966-31-9	LA-508-481	U	-0.71	5.1	pCi/L	1	8.6		03/09/09

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 # WSCF90134
Project Number F09-019

QC Batch 19599
Associated Samples 90134001

Test Anions by Ion Chromatography (Water)

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK			**QC Sample #4801**							
Fluoride	16984-48-8		<0.023	ug/mL					U	02/26/09
Chloride	16887-00-6		<0.047	ug/mL					U	02/26/09
Nitrite-N	NO2-N		<0.013	ug/mL					U	02/26/09
Nitrate-N	NO3-N		<0.012	ug/mL					U	02/26/09
Phosphate-P	PO4-P		<0.061	ug/mL					U	02/26/09
Sulfate	14808-79-8		<0.13	ug/mL					U	02/26/09
LCS			**QC Sample #4802**							
Fluoride	16984-48-8		0.985	ug/mL	98.5	90 - 110				02/26/09
Chloride	16887-00-6		1.96	ug/mL	100.2	90 - 110				02/26/09
Nitrite-N	NO2-N		0.975	ug/mL	99.6	90 - 110				02/26/09
Nitrate-N	NO3-N		0.870	ug/mL	98.8	90 - 110				02/26/09
Phosphate-P	PO4-P		1.87	ug/mL	98.4	90 - 110				02/26/09
Sulfate	14808-79-8		3.89	ug/mL	99.1	90 - 110				02/26/09
DUP			**QC Sample #4803**							
			Original 90132001							
Fluoride	16984-48-8		0.0806	ug/mL			7.60	20	BD	02/26/09
Chloride	16887-00-6		3.99	ug/mL			3.30	20	D	02/26/09
Nitrite-N	NO2-N		<0.026	ug/mL			0.00	20	UD	02/26/09
Nitrate-N	NO3-N		1.40	ug/mL			1.40	20	D	02/26/09
Phosphate-P	PO4-P		<0.12	ug/mL			0.00	20	UD	02/26/09

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF90134
Project Number F09-019

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Sulfate	14808-79-8		19.9	ug/mL			1.00	20	D	02/26/09
MS			**QC Sample #4804**							
			Original 90132001							
Fluoride	16984-48-8		1.09	ug/mL	98.5	80 - 120			D	02/26/09
Chloride	16887-00-6		5.76	ug/mL	95.2	80 - 120			D	02/26/09
Nitrite-N	NO2-N		0.948	ug/mL	94.9	80 - 120			D	02/26/09
Nitrate-N	NO3-N		2.29	ug/mL	96.7	80 - 120			D	02/26/09
Phosphate-P	PO4-P		1.84	ug/mL	95.2	80 - 120			D	02/26/09
Sulfate	14808-79-8		23.8	ug/mL	92.2	80 - 120			D	02/26/09
MSD			**QC Sample #4805**							
			Original 90132001					**Paired**	**4804**	
Fluoride	16984-48-8		1.11	ug/mL	100.7	80 - 120	2.20	20	D	02/26/09
Chloride	16887-00-6		5.77	ug/mL	95.9	80 - 120	0.70	20	D	02/26/09
Nitrite-N	NO2-N		0.949	ug/mL	95	80 - 120	0.10	20	D	02/26/09
Nitrate-N	NO3-N		2.31	ug/mL	98.9	80 - 120	2.20	20	D	02/26/09
Phosphate-P	PO4-P		1.88	ug/mL	97.3	80 - 120	2.20	20	D	02/26/09
Sulfate	14808-79-8		23.9	ug/mL	95.8	80 - 120	3.80	20	D	02/26/09

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF90134
Project Number F09-019

QC Batch 21333
Associated Samples 90134001

Test ICP-6010 - All possible metals

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
BLANK			**QC Sample #5727**								
Magnesium	7439-95-4		<50	ug/mL						U	03/25/09
Potassium	7440-09-7		<170	ug/mL						U	03/25/09
Sodium	7440-23-5		<51	ug/mL						U	03/25/09
Calcium	7440-70-2		<73	ug/mL						U	03/25/09
LCS			**QC Sample #5728**								
Magnesium	7439-95-4		1010	ug/mL	101.2	80 - 120					03/25/09
Potassium	7440-09-7		10300	ug/mL	102.7	80 - 120					03/25/09
Sodium	7440-23-5		1070	ug/mL	107.2	80 - 120					03/25/09
Calcium	7440-70-2		977	ug/mL	97.7	80 - 120					03/25/09
MS			**QC Sample #5729**								
			Original	**90125003**							
Magnesium	7439-95-4		24500	ug/L	171	75 - 125					03/25/09
Potassium	7440-09-7		15500	ug/L	103.4	75 - 125					03/25/09
Sodium	7440-23-5		22400	ug/L	165	75 - 125					03/25/09
Calcium	7440-70-2		76300	ug/L	104	75 - 125					03/25/09
MSD			**QC Sample #5730**								
			Original	**90125003**					**Paired**	**5729**	
Magnesium	7439-95-4		23700	ug/L	91	75 - 125	61.10	20	*		03/25/09
Potassium	7440-09-7		15100	ug/L	99.4	75 - 125	3.90	20			03/25/09
Sodium	7440-23-5		21400	ug/L	63	75 - 125	89.50	20	*		03/25/09

Quality Control Report

Attention Michael Neely
Department Inorganic

Group # WSCF90134
Project Number F09-019

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
Calcium	7440-70-2		75500	ug/L	26	75 - 125	120.00	20	*	03/25/09

Quality Control Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF90134
Project Number F09-019

QC Batch 20014
Associated Samples 90134001

Test Gamma Energy Analysis-general

Analyte	CAS #	Original Found	QC Found	Units	% Recov Limits	RPD	RPD Limit	RQ	Analyzed
IBLANK			**QC Sample #4998**						
Americium-241	14596-10-2		-80	pCi/L				U	03/12/09
Antimony-125	14234-35-6		1.2	pCi/L				U	03/12/09
Barium-133	13981-41-4		2.7	pCi/L				U	03/12/09
Cerium-144	14762-78-8		-16	pCi/L				U	03/12/09
Cerium/Praseodynium-1	CE/PR-144		-31	pCi/L				U	03/12/09
Cesium-134	13967-70-9		5.3	pCi/L				U	03/12/09
Cesium-137	10045-97-3		0.39	pCi/L				U	03/12/09
Cobalt-60	10198-40-0		-1.7	pCi/L				U	03/12/09
Europium-152	14683-23-9		-7.4	pCi/L				U	03/12/09
Europium-154	15585-10-1		5.4	pCi/L				U	03/12/09
Europium-155	14391-16-3		-5.0	pCi/L				U	03/12/09
Niobium-94	14681-63-1		1.3	pCi/L				U	03/12/09
Potassium-40	13966-00-2		-2.6	pCi/L				U	03/12/09
Radium-226	13982-63-3		19	pCi/L				U	03/12/09
Radium-228	15262-20-1		-8.5	pCi/L				U	03/12/09
Ruthenium-106	13967-48-1		-76	pCi/L				U	03/12/09
Tin-126	15832-50-5		-12	pCi/L				U	03/12/09
Thorium-234	15065-10-8		-590	pCi/L				U	03/12/09
Uranium-235	15117-96-1		-60	pCi/L				U	03/12/09
Zinc-65	13982-39-3		3.2	pCi/L				U	03/12/09
Actinium-228	14331-83-0		-8.5	pCi/L				U	03/12/09

Quality Control Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF90134
Project Number F09-019

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
Bismuth-212	14913-49-6		73	pCi/L						1X	03/12/09
Bismuth-214	14733-03-0		47	pCi/L						1X	03/12/09
Lead-212	15092-94-1		-17	pCi/L						U	03/12/09
Lead-214	15067-28-4		52	pCi/L						U	03/12/09
Ruthenium-103	13968-53-1		-0.70	pCi/L						U	03/12/09
Tin-113	13966-06-8		2.4	pCi/L						U	03/12/09
Thallium-208	14913-50-9		-2.3	pCi/L						U	03/12/09
Beryllium-7	13966-02-4		-10	pCi/L						U	03/12/09
Cobalt-57	13981-50-5		-1.0	pCi/L						U	03/12/09
Manganese-54	13966-31-9		0.17	pCi/L						U	03/12/09
LCS			**QC Sample #4999**								
Americium-241	14596-10-2		1.6E7	pCi/Sample	100.1	80 - 120					03/10/09
Cesium-137	10045-97-3		6.3E6	pCi/Sample	105	80 - 120					03/10/09
Cobalt-60	10198-40-0		9.9E6	pCi/Sample	99.2	80 - 120					03/10/09
DUP			**QC Sample #5000**								
			Original 90154001								
Americium-241	14596-10-2		-5.1	pCi/L			229.20	-20 - 20	*	U	03/10/09
Antimony-125	14234-35-6		-1.9	pCi/L			283.50	-20 - 20	*	U	03/10/09
Barium-133	13981-41-4		23	pCi/L			8.30	-20 - 20		U	03/10/09
Cerium-144	14762-78-8		49	pCi/L			952.90	-20 - 20	*	U	03/10/09
Cerium/Praseodynium-1	CE/PR-144		99	pCi/L			931.40	-20 - 20	*	U	03/10/09
Cesium-134	13967-70-9		4.4	pCi/L			504.00	-20 - 20	*	U	03/10/09
Cesium-137	10045-97-3		69	pCi/L			1.50	-20 - 20			03/10/09
Cobalt-60	10198-40-0		0.79	pCi/L			10333.3	-20 - 20	*	U	03/10/09
Europium-152	14683-23-9		29	pCi/L			82.90	-20 - 20	*	U	03/10/09
Europium-154	15585-10-1		-2.6	pCi/L			-92.80	-20 - 20	*	U	03/10/09
Europium-155	14391-16-3		-8.9	pCi/L			-1027.60	-20 - 20	*	U	03/10/09

Quality Control Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF90134
Project Number F09-019

Analyte	CAS #	Original Found	QC Found	Units	% Recov Limits	RPD	RPD Limit		RQ	Analyzed
Niobium-94	14681-63-1		5.6	pCi/L		207.30	-20 - 20	*	U	03/10/09
Potassium-40	13966-00-2		160	pCi/L		6.50	-20 - 20			03/10/09
Radium-226	13982-63-3		-1.7	pCi/L		218.20	-20 - 20	*	U	03/10/09
Radium-228	15262-20-1		17	pCi/L		69.80	-20 - 20	*	U	03/10/09
Ruthenium-106	13967-48-1		-5.5	pCi/L		-323.80	-20 - 20	*	U	03/10/09
Tin-126	15832-50-5		-4.4	pCi/L		-127.90	-20 - 20	*	U	03/10/09
Thorium-234	15065-10-8		-200	pCi/L		-16.20	-20 - 20		U	03/10/09
Uranium-235	15117-96-1		17	pCi/L		42.90	-20 - 20	*	U	03/10/09
Zinc-65	13982-39-3		-32	pCi/L		-154.60	-20 - 20	*	U	03/10/09
Actinium-228	14331-83-0		17	pCi/L		69.80	-20 - 20	*	U	03/10/09
Bismuth-212	14913-49-6		71	pCi/L		75.70	-20 - 20	*	U	03/10/09
Bismuth-214	14733-03-0		-1.7	pCi/L		218.20	-20 - 20	*	U	03/10/09
Lead-212	15092-94-1		45	pCi/L		22.20	-20 - 20	*		03/10/09
Lead-214	15067-28-4		-21	pCi/L		2300.00	-20 - 20	*	U	03/10/09
Ruthenium-103	13968-53-1		-2.3E-3	pCi/L		-199.70	-20 - 20	*	U	03/10/09
Tin-113	13966-06-8		44	pCi/L		186.00	-20 - 20	*	U	03/10/09
Thallium-208	14913-50-9		2.5	pCi/L		153.40	-20 - 20	*	U	03/10/09
Beryllium-7	13966-02-4		3800	pCi/L		199.40	-20 - 20	*		03/10/09
Cobalt-57	13981-50-5		23	pCi/L		100.70	-20 - 20	*	U	03/10/09
Manganese-54	13966-31-9		-4.5	pCi/L		-466.70	-20 - 20	*	U	03/10/09

Quality Control Report

Attention Michael Neely
Department Radiochemistry

Group # WSCF90134
Project Number F09-019

QC Batch 20531
Associated Samples 90134001

Test Gross Alpha/Gross Beta

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit		RQ	Analyzed
BLANK			**QC Sample #5264**								
Gross Alpha	12587-46-1		0.71	pCi/L						1X	03/23/09
Gross Beta	12587-47-2		-0.41	pCi/L						U	03/23/09
LCS			**QC Sample #5265**								
Gross Alpha	12587-46-1		33	pCi/L	101.7	80 - 120					03/23/09
Gross Beta	12587-47-2		120	pCi/L	110	80 - 120					03/23/09
DUP			**QC Sample #5266**								
			Original 90134001								
Gross Alpha	12587-46-1	0.090	0.090	pCi/L			0.00	-20 - 20			03/23/09
Gross Beta	12587-47-2	1.5	0.38	pCi/L			119.10	-20 - 20	*	1X	03/23/09

Analytical Comment Report

Attention Michael Neely

Group # WSCF90134
Project Number F09-019

90134001 **B1YRK8**

ICP-AES: The following elements sample concentraton exceed spiking level by a factor of 4. Spike recoveries are not valid: magnesium, sodium, and calcium.

Quality Control Comments

Department Radiochemistry

4998 IBLANK for HBN 20014 [RADP/126

Analyte Bismuth-212 - Gamma Energy Analysis-general
[1] The blank is above MDC but is acceptable.

4998 IBLANK for HBN 20014 [RADP/126

Analyte Bismuth-214 - Gamma Energy Analysis-general
[1] The blank is above MDC but is acceptable.

Department Radiochemistry

5264 BLANK for HBN 20531 [RADP/1286

Analyte Gross Alpha - Gross Alpha/Gross Beta
[1] The blank is above MDC but is acceptable.

Department Radiochemistry

5266 B1YRK8(90134001DUP)

Analyte Gross Beta - Gross Alpha/Gross Beta
[1] Duplicate RPD out-of-limits. RPD limit does not apply to results near the Minimum Detectable Concentration.

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 #:	131280
Work Order #:	90134
Profile #:	F09-019-001
Proj. Mgr.:	
Phone:	

The following samples were received from you on 2/26/2009 2:10:00 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
		Tests scheduled		
90134001	B1YRK8	WATER	2/26/2009 13:30	2/26/2009 14:
		6010-W; GAB-AO-W; GAB-BO-W; GEA-W; IC-W		

Test Acronym Description

Test Acronym	Description
6010-W	ICP-AES (W)
GAB-AO-W	Gross Alpha/Beta (A only)(W)
GAB-BO-W	Gross Alpha/Beta (B only)(W)
GEA-W	Gamma Energy Analysis (W)
IC-W	Anions by IC (W)

Sample Receipt

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F09-019-001	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 7N	DATA TURNAROUND
Kauer	WIDRIG, DL	376-2858	WIDRIG, DL	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
C7047; EB-1-009	200-BC-1 DVZ Soil Desiccation -QC Sampling		F09-019		
ICE CHEST NO.	**FIELD LOGBOOK NO.**	**ACTUAL SAMPLE DEPTH**	**COA**	**METHOD OF SHIPMENT**	
	HNF-N-585-326	N/A	301405E510	GOVERNMENT VEHICLE	
SHIPPED TO	**OFFSITE PROPERTY NO.**		**BILL OF LADING/AIR BILL NO.**		
Waste Sampling & Characterization	N/A		N/A		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS: Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR / IATA Dangerous Goods Regulations but are not regulated per DOE Order 5400.5 (1990/1993)

90134

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	HNO3 to pH <2	Cool~4C	HNO3 to pH <2	HNO3 to pH <2
TYPE OF CONTAINER	G/P	P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1	1
VOLUME	500mL	500mL	500mL	500mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS	Gamma Spectroscopy	SEE ITEM (3) IN SPECIAL INSTRUCTIONS

ICED

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B1YRK8	001 WATER	2-26-09	13:30	✓	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Ed Kauer / [signature]	2-26-09 1410	[signature] / [signature]	2-26-09 1410
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF.
(1)ICP Metals - 6010B (TAL) {Calcium, Magnesium, Potassium, Sodium}
(2)IC Anions - 300.0 {Chloride, Fluoride, Nitrogen in Nitrate, Nitrogen in Nitrite, Phosphate, Sulfate}
(3)Gross Alpha and Gross Beta (Alpha Discrete) {Gross alpha, Gross beta}