

SEPTEMBER 30, 2013

WSCF Laboratory

PO Box 650 S3-30
Richland, WA 99352



September 30, 2013

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

Dear Scot Fitzgerald,

FINAL RESULT FOR SAMPLE DELIVERY GROUP WSCF130996

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 WSCF130996

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

Very truly yours,

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

Electronically signed by Joseph Hale

For Lab Manager, Dan T. Smith

WSCF Analytical Lab

(509) 373-4804

Attachments 4

CC: w/Attachments

File/LB

ATTACHMENT 1

COVER SHEET

Consisting of 2 pages
Including cover page

WSCF SAF Number Cross Reference

Group # WSCF130996
Data Deliverable Date 09/30/13

SAF #	Sample ID	Sample #	Matrix	Sampled	Received
F11-031	B2RKF6	130996001	OTHERSOLID	09/13/13	09/13/13

ATTACHMENT 2

NARRATIVE

Consisting of 5 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), Master Contract 39818, Revision 3, "Laboratory Analytical Services to CHPRC Soil and Groundwater Remediation Project."*

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

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

- All applicable QC controls are within the established limits.

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):

- 1,4-Dichlorobenzene, 2-Methylphenol and Hexachloroethane did not meet the MS or MSD acceptance limits. Sample results for this analytes were "T" Flagged.
- 1,4-Dichlorobenzene and 2-Methylphenol did not meet the MS / MSD RPD acceptance limits. Sample results for this analyte were not flagged. The quality control report was flagged for RPD failure.
- Sample B2RKF6 (130996001) did not meet the acceptance limits for surrogates Fluoranthene-d10 and Terphenyl-d14. The Matrix Spike did not meet the acceptance limits for surrogates 2-Fluorophenol, Phenol-d5, Nitrobenzene-d5, 2,4,6-Tribromophenol, 2-Fluorobiphenyl, 2-Methylnaphthalene-d10, Fluoranthene-d10 and Terphenyl-d14. The Matrix Spike Duplicate did not meet the acceptance limits for surrogates 2-Fluorophenol, 2,4,6-Tribromophenol, 2-Fluorobiphenyl, 2-Methylnaphthalene-d10, Fluoranthene-d10 and Terphenyl-d14. Sample results were not flagged. The quality control report was flagged for surrogate recovery failure.
- Due to the nature of the charcoal sample matrix, it was expected that the routine manner of spiking the samples would produce MS and MSD recovery failures and low surrogate recoveries. Therefore, the samples were prepped as routine and then they were re-prepped using post extraction addition of surrogate and matrix spike. The samples, MS and MSD that were processed using the post extraction addition of surrogate and matrix spike have no QC problems. A table with this information is provided below:

Analyte	CAS#	Original Found	QC Found	Units	% Recovery	Recovery Limits	RPD	RPD Limit	RQ	Analyzed
Original #130996001										
MS										
1,4-Dichlorobenzene	106-46-7	ND	21.5	ug/mL	107.6	52-116				9/26/2013
2-Methylphenol	95-48-7	ND	32.1	ug/mL	107.0	34-121				9/26/2013
Hexachloroethane	67-72-1	322.7	418.8	ug/mL	1396.0	51-116			E	9/26/2013
MSD										
Original #130996001										
1,4-Dichlorobenzene	106-46-7	ND	23.6	ug/mL	117.8	52-116	9.0	30		9/26/2013
2-Methylphenol	95-48-7	ND	35.3	ug/mL	117.6	34-121	9.4	30		9/26/2013
Hexachloroethane	67-72-1	322.7	375.2	ug/mL	1250.6	51-116	11.0	30	E	9/26/2013

Analyte	CAS#	Original Found	QC Found	Units	% Recovery	Recovery Limits	RPD	RPD Limit	RQ	Analyzed
SAMPLE		Sample #130996001								
2-Fluorophenol	367-12-4		22.8	ug/mL	113.8	30-120				9/26/2013
Phenol-d5	4165-62-2		23.1	ug/mL	115.5	59-116				9/26/2013
Nitrobenzene-d5	4165-60-0		22.2	ug/mL	110.9	30-118				9/26/2013
2-Methylnaphthalene-d10	7297-45-2		22.5	ug/mL	112.5	60-120				9/26/2013
2-Fluorobiphenyl	321-60-8		22.3	ug/mL	111.3	42-105				9/26/2013
2,4,6-Tribromophenol	118-79-6		18.7	ug/mL	93.6	60-120				9/26/2013
Fluoranthene-d10	93951-69-0		22.2	ug/mL	111.1	60-120				9/26/2013
Terphenyl-d14	98904-43-9		23.4	ug/mL	117.2	60-120				9/26/2013
MS		Original #130996001								
2-Fluorophenol	367-12-4		22.3	ug/mL	111.6	42-105				9/26/2013
Phenol-d5	4165-62-2		22.2	ug/mL	110.9	54-120				9/26/2013
Nitrobenzene-d5	4165-60-0		23.0	ug/mL	114.9	64-111				9/26/2013
2-Methylnaphthalene-d10	7297-45-2		23.7	ug/mL	118.5	60-120				9/26/2013
2-Fluorobiphenyl	321-60-8		21.3	ug/mL	106.6	56-122				9/26/2013
2,4,6-Tribromophenol	118-79-6		20.5	ug/mL	102.5	24-122				9/26/2013
Fluoranthene-d10	93951-69-0		21.4	ug/mL	107.2	60-120				9/26/2013
Terphenyl-d14	98904-43-9		22.5	ug/mL	112.4	35-150				9/26/2013
MSD		Original #130996001								
2-Fluorophenol	367-12-4		24.5	ug/mL	122.3	42-105				9/26/2013
Phenol-d5	4165-62-2		24.1	ug/mL	120.6	54-120				9/26/2013
Nitrobenzene-d5	4165-60-0		25.0	ug/mL	124.8	64-111				9/26/2013
2-Methylnaphthalene-d10	7297-45-2		24.6	ug/mL	123.1	60-120				9/26/2013
2-Fluorobiphenyl	321-60-8		23.5	ug/mL	117.4	56-122				9/26/2013
2,4,6-Tribromophenol	118-79-6		22.5	ug/mL	112.6	24-122				9/26/2013
Fluoranthene-d10	93951-69-0		23.7	ug/mL	118.6	60-120				9/26/2013
Terphenyl-d14	98904-43-9		24.0	ug/mL	119.9	35-150				9/26/2013

- All other applicable QC controls are within the established limits.

Radiochemistry Comments

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

Tracers are used to determine chemical yield. RPD is monitored in sample duplicate and is not required for tracer recovery per SOW.

Gamma Energy Analysis:

- All applicable QC controls are within the established limits.

Gross Alpha / Gross Beta:

- Gross Alpha – The LCS recovery was outside laboratory acceptance limits, but within the 70 – 130% range allowed in the SOW.
- All other applicable QC controls are within the established limits.

Americium-241:

- The Blank is less than five times the MDC. “B” Flag not required.
- All other applicable QC controls are within the established limits.

Isotopic Plutonium analysis:

- Plutonium-239/240 – Duplicate Relative Percent Difference(s) (RPD) did not meet the established laboratory limits. Duplicate Relative Percent Difference (RPD) does not apply to results below 5X the minimum detectable activity. No flags issued.
- All other applicable QC controls are within the established limits.

Neptunium-237 analysis:

- All applicable QC controls are within the established limits.

Isotopic Uranium analysis:

- Uranium-238 – Duplicate Relative Percent Difference(s) (RPD) did not meet the established laboratory limits. Duplicate Relative Percent Difference (RPD) does not apply to results with greater than 20% counting uncertainty. No flags issued.
- Uranium-234 – The Blank is less than five times the MDC. “B” Flag not required.
- All other applicable QC controls are within the established limits.

Strontium-89/90:

- All applicable QC controls are within the established limits.

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

ATTACHMENT 3

ANALYTICAL RESULTS

Consisting of 40 pages
Including cover page

SEPTEMBER 30, 2013

WSCF ANALYTICAL RESULTS REPORT

For

CH2M Hill Plateau Remediation

PO Box 1600
Richland, WA 99352

Attention: Scot Fitzgerald

Contract # MOA-FH-CHPRC-2008
Group # WSCF130996
Report Date September 30, 2013

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 # WSCF130996

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
221556	221579	4	BLANK	98165	BLANK		ICP-2008 MS All possible metal
221556	221579	5	LCS	98166	LCS		ICP-2008 MS All possible metal
221556	221579	6	SAMPLE	130996001	B2RKF6		ICP-2008 MS All possible metal
221556	221579	7	MS	98167	B2RKF6(130996001MS)	130996001	ICP-2008 MS All possible metal
221556	221579	8	MSD	98168	B2RKF6(130996001MSD)	130996001	ICP-2008 MS All possible metal

Batch QC List

Attention Scot Fitzgerald
 Department Organic, Semivolatiles

Group # WSCF130996

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
221605	221631	1	BLANK	98302	BLANK		SW-846 8270D Semivolatiles
221605	221631	2	LCS	98303	LCS		SW-846 8270D Semivolatiles
221605	221631	3	MS	98304	B2RKF6(130996001MS)	130996001	SW-846 8270D Semivolatiles
221605	221631	4	MSD	98305	B2RKF6(130996001MSD)	130996001	SW-846 8270D Semivolatiles
221605	221631	5	SAMPLE	130996001	B2RKF6		SW-846 8270D Semivolatiles
221605	221631	6	SAMPLE	130996001	B2RKF6		SW-846 8270D Semivolatiles

Batch QC List

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
221352	221360	1	IBLANK	97771	IBLANK		Gamma Energy Analysis-general
221352	221360	2	LCS	97772	LCS		Gamma Energy Analysis-general
221352	221360	3	DUP	97773	B2RKF6(130996001DUP)	130996001	Gamma Energy Analysis-general
221352	221360	4	SAMPLE	130996001	B2RKF6		Gamma Energy Analysis-general
221408	221596	1	BLANK	97986	BLANK		Americium/Curium (AEA)
221408	221596	2	LCS	97987	LCS		Americium/Curium (AEA)
221408	221596	3	SAMPLE	130996001	B2RKF6		Americium/Curium (AEA)
221408	221596	4	DUP	97988	B2RKF6(130996001DUP)	130996001	Americium/Curium (AEA)
221408	221597	1	BLANK	97986	BLANK		Plutonium (AEA)
221408	221597	2	LCS	97987	LCS		Plutonium (AEA)
221408	221597	3	SAMPLE	130996001	B2RKF6		Plutonium (AEA)
221408	221597	4	DUP	97988	B2RKF6(130996001DUP)	130996001	Plutonium (AEA)
221408	221598	1	BLANK	97986	BLANK		Uranium (AEA)
221408	221598	2	LCS	97987	LCS		Uranium (AEA)
221408	221598	3	SAMPLE	130996001	B2RKF6		Uranium (AEA)
221408	221598	4	DUP	97988	B2RKF6(130996001DUP)	130996001	Uranium (AEA)
221409	221594	1	BLANK	97989	BLANK		Neptunium (AEA)
221409	221594	2	LCS	97990	LCS		Neptunium (AEA)
221409	221594	3	SAMPLE	130996001	B2RKF6		Neptunium (AEA)
221409	221594	4	NpSPK	97991	B2RKF6(130996001NpS		Neptunium (AEA)
221409	221594	5	NpDUP	97992	B2RKF6(130996001NpD)	130996001	Neptunium (AEA)
221409	221594	6	NDUPSK	97993	B2RKF6(130996001NDU		Neptunium (AEA)
221508	221548	1	BLANK	98059	BLANK		GAB Discrete analysis Alpha only

Batch QC List

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
221508	221548	2	LCS	98060	LCS		GAB Discrete analysis Alpha only
221508	221548	3	DUP	98061	B2RKF6(130996001DUP) 130996001		GAB Discrete analysis Alpha only
221508	221548	4	SAMPLE	130996001	B2RKF6		GAB Discrete analysis Alpha only
221508	221550	1	BLANK	98059	BLANK		GAB Discrete analysis Beta only
221508	221550	2	LCS	98060	LCS		GAB Discrete analysis Beta only
221508	221550	3	DUP	98061	B2RKF6(130996001DUP) 130996001		GAB Discrete analysis Beta only
221508	221550	4	SAMPLE	130996001	B2RKF6		GAB Discrete analysis Beta only
221528	221602	1	BLANK	98085	BLANK		Strontium 89/90 (GPC/GEA)
221528	221602	2	LCS	98086	LCS		Strontium 89/90 (GPC/GEA)
221528	221602	3	DUP	98087	B2RKF6(130996001DUP) 130996001		Strontium 89/90 (GPC/GEA)
221528	221602	4	SAMPLE	130996001	B2RKF6		Strontium 89/90 (GPC/GEA)

Batch QC List

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF130996

QC Batch	Analytical Batch	S#	Type	Sample #	Client Sample#	Original	Test
221510	221510	1	LCS	98071	LCS		Dry Weight/Percent Moisture
221510	221510	3	DUP	98072	B2RJ08(130924001DUP)	130924001	Dry Weight/Percent Moisture
221510	221510	4	SAMPLE	130996001	B2RKF6		Dry Weight/Percent Moisture

Method Reference

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF130996

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.

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 Scot Fitzgerald
 Department Organic, Semivolatiles

Group # WSCF130996

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-523-456	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)

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 Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

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-220-406	Strontium-89 and 90 in Aqueous Samples by SR-SPEC Separation HEIS SRTOT_SEP_PRECIP_GPC	Strontium 89/90, by Sr-Spec Sep.
LA-508-471	Thorium, Neptunium, Plutonium, Americium, and Uranium In Soil and Water Using Eichrom Column Separation (Prep) HEIS PUIISO_IE_PRECIP_AEA	Isotopic Plutonium, Alpha Spec
LA-508-471	Determination Of Uranium, Plutonium, And Americium HEIS AMCMISO_IE_PREC_AEA	Americium/Curium Iso, Alpha Spec
LA-508-481	Gamma Energy Analysis using the Canberra Genie Ssystem HEIS GAMMA_GS	Gamma Energy Analysis
LA-508-471	Determination Of Uranium, Plutonium, And Americium HEIS UIISO_IE_PRECIP_AEA	Uranium Iso, Alpha Spec
LA-904-400	Thorium, Neptunium, Plutonium, Americium, and Uranium In Soil and Water Using Eichrom Column Separation HEIS NP237_IE_PRECIP_AEA	Neptunium-237, Iso, Alpha Spec.
LA-548-401	Alpha and Beta in Liquid and Solid Samples - WSCF N/A PREP METHOD	
LA-548-421(LSC)	Preparation of Sample Mounts For Gamma Energy Analysis N/A PREP METHOD	
LA-904-400	Nitric Acid-Hydrochloric Acid Leach of Soil and Vegetation at WSCF N/A PREP 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>

Method Reference

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF130996

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-519-412	Total Residual Percent Solids Dried at 103 - 105 Degrees C		
	EPA-600/4-79-020	160.3	Total Residue
	Standard Methods	2540B	Total Solids Dried at 103-105 C
	HEIS	%SOLIDS	Dry Weight, Percent Solids

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 # WSCF130996

Sample # 130996001
 SAF# F11-031
 Sample ID B2RKF6

Matrix OTHERSOLID
 Sampled 09/13/13
 Received 09/13/13

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
ICPMS Prep (S)										09/23/13
ICP-2008 MS All possible metal										
Uranium	7440-61-1	LA-505-412		0.544		mg/kg	1	0.061		09/24/13

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.
 o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Organic, Semivolatiles

Group # WSCF130996

Sample # 130996001
 SAF# F11-031
 Sample ID B2RKF6

Matrix OTHERSOLID
 Sampled 09/13/13
 Received 09/13/13

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Preparation for 8270 (S) ASE										
SW-846 8270D Semivolatiles										
1,4-Dichlorobenzene	106-46-7	LA-523-456	UT	<600		ug/kg	1	600	800	09/26/13
Bis-(2-Chloroethyl) ether	111-44-4	LA-523-456	U	<600		ug/kg	1	600	800	09/26/13
Hexachlorobutadiene	87-68-3	LA-523-456	U	<600		ug/kg	1	600	800	09/26/13
2-Methylphenol	95-48-7	LA-523-456	UT	<600		ug/kg	1	600	800	09/26/13
1,2-Dichlorobenzene	95-50-1	LA-523-456	U	<600		ug/kg	1	600	800	09/26/13
3 & 4 Methylphenol, Total	65794-96-9	LA-523-456	U	<600		ug/kg	1	600	800	09/26/13
Hexachloroethane	67-72-1	LA-523-456	DT	2.3E5		ug/kg	20	1.E4	2.E4	09/26/13

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 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 - 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)
 o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Sample # 130996001
 SAF# F11-031
 Sample ID B2RKF6

Matrix OTHERSOLID
 Sampled 09/13/13
 Received 09/13/13

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Am/Cm/Pu/U/Np Prep (AEA) S										09/24/13
Americium/Curium (AEA)										
Americium-241	14596-10-2	LA-508-471	U	-2.5E-3	.014	pCi/g	1	0.030		09/25/13
Plutonium (AEA)										
Plutonium-238	13981-16-3	LA-508-471	U	-1.6E-3	.0049	pCi/g	1	0.015		09/25/13
Plutonium-239_240	PU-239/240	LA-508-471	U	4.7E-3	.0057	pCi/g	1	9.4E-3		09/25/13
Uranium (AEA)										
Uranium-234	U-233/234	LA-508-471		0.26	.073	pCi/g	1	0.021		09/25/13
Uranium-235	15117-96-1	LA-508-471		0.015	.012	pCi/g	1	0.015		09/25/13
Uranium-238	U-238	LA-508-471		0.20	.058	pCi/g	1	0.021		09/25/13
GAB Prep for Discrete Analysis (S)										09/20/13
GAB Discrete analysis Alpha only										
Gross Alpha	12587-46-1	LA-508-415		0.80	.26	pCi/g	1	0.29		09/23/13
GAB Discrete analysis Beta only										
Gross Beta	12587-47-2	LA-508-415		2.3	.44	pCi/g	1	0.56		09/23/13
Np Prep Solid (AEA) S										09/24/13
Neptunium (AEA)										
Neptunium-237	13994-20-2	LA-904-400	U	4.5E-3	.03	pCi/g	1	0.064		09/25/13
Preparation for GEA (S)										09/16/13

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 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.
 PQL is equivalent to Estimated Quantitation Limit (EQL)

o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Sample # 130996001
 SAF# F11-031
 Sample ID B2RKF6

Matrix OTHERSOLID
 Sampled 09/13/13
 Received 09/13/13

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
Gamma Energy Analysis-general										
Cesium-137	10045-97-3	LA-508-481	U	3.5E-3	.0052	pCi/g	1	8.6E-3		09/24/13
Cobalt-60	10198-40-0	LA-508-481	U	6.5E-5	.0041	pCi/g	1	7.8E-3		09/24/13
Europium-152	14683-23-9	LA-508-481	U	0.012	.014	pCi/g	1	0.024		09/24/13
Europium-154	15585-10-1	LA-508-481	U	-0.0070	.012	pCi/g	1	0.022		09/24/13
Europium-155	14391-16-3	LA-508-481	U	0.025	.016	pCi/g	1	0.030		09/24/13
Protactinium-231	14331-85-2	LA-508-481	U	0.21	.2	pCi/g	1	0.38		09/24/13
Strontium 89/90 SOLID/SOIL PREP										09/24/13
Strontium 89/90 (GPC/GEA)										
Strontium-89_90	SR-RAD	LA-220-406	U	-0.27	.38	pCi/g	1	0.60		09/30/13

MDL = Minimum Detection Limit
 RQ = Result Qualifier
 TP Err = Total Propagated Error
 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.
 PQL is equivalent to Estimated Quantitation Limit (EQL)

o - LCS recovery outside established laboratory acceptance limits.

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF130996

Sample # 130996001
 SAF# F11-031
 Sample ID B2RKF6

Matrix OTHERSOLID
 Sampled 09/13/13
 Received 09/13/13

Test Performed	CAS #	Method	RQ	Result	TP Err	Units	DF	MDL	PQL	Analyzed
										09/19/13
Dry Weight/Percent Moisture										
Percent Solids	%SOLIDS	LA-519-412		91		%	1			09/19/13

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

B - Analyte < the RDL but >= the IDL/MDL.
 C - Analyte was found in the Associated Blank. (Inorganic)
 D - Analyte was reported at a secondary dilution factor.
 N - MS and/or MSD sample recovery outside control limits.
 U - Analyzed for but not detected above limiting criteria.

N - Spike Recovery is Outside Control Limits.
 X,Y or Z - See comment detail and/or narrative.
 PQL is equivalent to Estimated Quantitation Limit (EQL)
 o - LCS recovery outside established laboratory acceptance limits.
 Ignitability: <20C listed in the result field indicates sample ignited at room temperature. Maximum temperature tested for ignitability is at 100C

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221360 (QC Batch: 221352) Test Gamma Energy Analysis-general
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
IBLANK		QC Sample #97771								
Cesium-137	10045-97-3		0.010	pCi/g					U	09/24/13
Cobalt-60	10198-40-0		3.9E-3	pCi/g					U	09/24/13
Europium-152	14683-23-9		2.8E-3	pCi/g					U	09/24/13
Europium-154	15585-10-1		-7.7E-3	pCi/g					U	09/24/13
Europium-155	14391-16-3		0.011	pCi/g					U	09/24/13
Protactinium-231	14331-85-2		0.32	pCi/g					U	09/24/13
LCS		QC Sample #97772								
Cesium-137	10045-97-3		6500	pCi/sample	107.3	80 - 120				09/16/13
Cobalt-60	10198-40-0		1.1E4	pCi/sample	111	80 - 120				09/16/13
DUP		QC Sample #97773								
		Original 130996001								
Cesium-137	10045-97-3	3.5E-3	1.6E-3	pCi/g			74.70	30	* U	09/24/13
Cobalt-60	10198-40-0	6.5E-5	3.9E-3	pCi/g			193.50	30	* U	09/24/13
Europium-152	14683-23-9	0.012	-6.7E-3	pCi/g			683.30	30	* U	09/24/13
Europium-154	15585-10-1	-0.0070	6.2E-3	pCi/g			-3022.70	30	* U	09/24/13
Europium-155	14391-16-3	0.025	0.012	pCi/g			74.60	30	* U	09/24/13
Protactinium-231	14331-85-2	0.21	0.13	pCi/g			46.80	30	* U	09/24/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Wet Chemistry

Group # WSCF130996

Analytical Batch 221510 (QC Batch: 221510) Test Dry Weight/Percent Moisture
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
LCS		QC Sample #98071								
Percent Solids	%SOLIDS	95		%	99.4	80 - 120				09/19/13
DUP		QC Sample #98072								
		Original 130924001								
Percent Solids	%SOLIDS	97		%			0.72	5		09/19/13

* - QC result out of range n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221548 (QC Batch: 221508) Test GAB Discrete analysis Alpha only
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #98059								
Gross Alpha	12587-46-1		0.14	pCi/g					U	09/23/13
LCS		QC Sample #98060								
Gross Alpha	12587-46-1		8.4	pCi/g	71.2	80 - 120			X	09/23/13
DUP		QC Sample #98061								
		Original 130996001								
Gross Alpha	12587-46-1	0.80	0.86	pCi/g			8.20	30		09/23/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221550 (QC Batch: 221508) Test GAB Discrete analysis Beta only
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #98059								
Gross Beta	12587-47-2		0.026	pCi/g					U	09/23/13
LCS		QC Sample #98060								
Gross Beta	12587-47-2		44	pCi/g	88.6	80 - 120				09/23/13
DUP		QC Sample #98061								
		Original 130996001								
Gross Beta	12587-47-2	2.3	2.2	pCi/g			5.00	30		09/23/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Inorganic

Group # WSCF130996

Analytical Batch 221579 (QC Batch: 221556) Test ICP-2008 MS All possible metal
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
			QC Sample #98165							
Uranium	7440-61-1		<0.050	ug/L					U	09/24/13
LCS										
			QC Sample #98166							
Uranium	7440-61-1		405	mg/kg	104	86 - 113				09/24/13
MS										
			QC Sample #98167							
			Original 130996001							
Uranium	7440-61-1	0.544	47.0	mg/kg	86.2	70 - 130				09/24/13
MSD										
			QC Sample #98168							
			Original 130996001							
								Paired 98167		
Uranium	7440-61-1	0.544	44.4	mg/kg	84.7	70 - 130	5.70	30		09/24/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221594 (QC Batch: 221409) Test Neptunium (AEA)
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK										
				QC Sample #97989						
Neptunium-237	13994-20-2		-6.1E-7	pCi/g					U	09/25/13
LCS				QC Sample #97990						
Neptunium-237	13994-20-2		6.4	pCi/sample	111.8	80 - 120				09/25/13
NpSPK				QC Sample #97991						
Neptunium-237	13994-20-2		5.8	pCi/g	101.3	75 - 125				09/25/13
NpDUP				QC Sample #97992						
				Original 130996001						
Neptunium-237	13994-20-2	4.5E-3	0.015	pCi/g			105.10	30	* U	09/25/13
NDUPSK				QC Sample #97993						
Neptunium-237	13994-20-2		5.6	pCi/g	97.7	75 - 125				09/25/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221596 (QC Batch: 221408) Test Americium/Curium (AEA)
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #97986								
Americium-241	14596-10-2		0.015	pCi/g					X	09/25/13
LCS		QC Sample #97987								
Americium-241	14596-10-2		5.4	pCi/sample	96.6	80 - 120				09/25/13
DUP		QC Sample #97988								
		Original 130996001								
Americium-241	14596-10-2	-2.5E-3	-6.9E-3	pCi/g			-101.00	30	* U	09/25/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221597 (QC Batch: 221408)
 Associated Samples 130996001

Test Plutonium (AEA)

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #97986								
Plutonium-238	13981-16-3		-0.0040	pCi/g					U	09/25/13
Plutonium-239_240	PU-239/240		6.7E-3	pCi/g					U	09/25/13
LCS		QC Sample #97987								
Plutonium-239_240	PU-239/240		5.5	pCi/sample	96.5	80 - 120				09/25/13
DUP		QC Sample #97988								
		Original 130996001								
Plutonium-238	13981-16-3	-1.6E-3	1.3E-3	pCi/g			-4533.30	30	* U	09/25/13
Plutonium-239_240	PU-239/240	4.7E-3	0.010	pCi/g			84.00	30	* X	09/25/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221598 (QC Batch: 221408) Test Uranium (AEA)
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #97986								
Uranium-234	U-233/234		0.029	pCi/g					X	09/25/13
Uranium-235	15117-96-1		5.6E-3	pCi/g					U	09/25/13
Uranium-238	U-238		0.015	pCi/g					U	09/25/13
LCS		QC Sample #97987								
Uranium-234	U-233/234		8.5	pCi/sample	104.1	80 - 120				09/25/13
DUP		QC Sample #97988								
		Original 130996001								
Uranium-234	U-233/234	0.26	0.31	pCi/g			26.30	30		09/25/13
Uranium-235	15117-96-1	0.015	0.018	pCi/g			28.40	30		09/25/13
Uranium-238	U-238	0.20	0.27	pCi/g			39.50	30	* X	09/25/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221602 (QC Batch: 221528) Test Strontium 89/90 (GPC/GEA)
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #98085								
Strontium-89_90	SR-RAD		0.24	pCi/g					U	09/30/13
LCS		QC Sample #98086								
Strontium-89_90	SR-RAD		25	pCi/g	113.5	80 - 120				09/30/13
DUP		QC Sample #98087								
		Original 130996001								
Strontium-89_90	SR-RAD	-0.27	0.040	pCi/g			-270.40	30	* U	09/30/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Organic, Semivolatiles

Group # WSCF130996

Analytical Batch 221631 (QC Batch: 221605) Test SW-846 8270D Semivolatiles
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
BLANK		QC Sample #98302								
1,4-Dichlorobenzene	106-46-7		<200	ug/kg					U	09/26/13
Bis-(2-Chloroethyl) ether	111-44-4		<200	ug/kg					U	09/26/13
Hexachlorobutadiene	87-68-3		<200	ug/kg					U	09/26/13
2-Methylphenol	95-48-7		<200	ug/kg					U	09/26/13
1,2-Dichlorobenzene	95-50-1		<200	ug/kg					U	09/26/13
3 & 4 Methylphenol, Total	65794-96-9		<200	ug/kg					U	09/26/13
Hexachloroethane	67-72-1		<200	ug/kg					U	09/26/13
LCS		QC Sample #98303								
1,4-Dichlorobenzene	106-46-7		4200	ug/kg	105.3	64 - 125				09/26/13
2-Methylphenol	95-48-7		6100	ug/kg	101.9	73 - 122				09/26/13
Hexachloroethane	67-72-1		5800	ug/kg	96.9	59 - 114				09/26/13
MS		QC Sample #98304								
		Original 130996001								
1,4-Dichlorobenzene	106-46-7	<600	3200	ug/kg	30	55 - 130			T	09/26/13
2-Methylphenol	95-48-7	<600	2800	ug/kg	17.5	61 - 129			T	09/26/13
Hexachloroethane	67-72-1	2.3E5	2.1E5	ug/kg	-91.2	38 - 132			T	09/26/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221596 (QC Batch: 221408) Test Americium/Curium (AEA)
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
SAMPLE		Sample #130996001								
Americium-243 Tracer	14993-75-0				100.3	25 - 105				09/25/13
BLANK		QC Sample #97986								
Americium-243 Tracer	14993-75-0				100.2	25 - 105				09/25/13
LCS		QC Sample #97987								
Americium-243 Tracer	14993-75-0				100.4	25 - 105				09/25/13
DUP		QC Sample #97988								
		Original 130996001								
Americium-243 Tracer	14993-75-0				100.3	25 - 105	n/a			09/25/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221597 (QC Batch: 221408)
 Associated Samples 130996001

Test Plutonium (AEA)

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
SAMPLE		Sample #130996001								
Plutonium-242 Tracer	13982-10-0				99.5	25 - 105				09/25/13
BLANK		QC Sample #97986								
Plutonium-242 Tracer	13982-10-0				99.6	25 - 105				09/25/13
LCS		QC Sample #97987								
Plutonium-242 Tracer	13982-10-0				99.6	25 - 105				09/25/13
DUP		QC Sample #97988								
		Original 130996001								
Plutonium-242 Tracer	13982-10-0				99.5	25 - 105	n/a			09/25/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221598 (QC Batch: 221408) Test Uranium (AEA)
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
SAMPLE		Sample #130996001								
Uranium-232 Tracer BLANK	14158-29-3				94.9	25 - 105				09/25/13
		QC Sample #97986								
Uranium-232 Tracer LCS	14158-29-3				95.3	25 - 105				09/25/13
		QC Sample #97987								
Uranium-232 Tracer DUP	14158-29-3				77.3	25 - 105				09/25/13
		QC Sample #97988								
		Original 130996001								
Uranium-232 Tracer	14158-29-3				83.8	25 - 105	n/a			09/25/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Radiochemistry

Group # WSCF130996

Analytical Batch 221602 (QC Batch: 221528) Test Strontium 89/90 (GPC/GEA)
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
SAMPLE			Sample #130996001							
Strontium-85	13967-73-2			pCi/sample	76.5	25 - 105				09/30/13
BLANK			QC Sample #98085							
Strontium-85	13967-73-2			pCi/sample	55.2	25 - 105				09/30/13
LCS			QC Sample #98086							
Strontium-85	13967-73-2			pCi/sample	46.7	25 - 105				09/30/13
DUP			QC Sample #98087							
			Original 130996001							
Strontium-85	13967-73-2	65		pCi/sample	77	25 - 105	n/a			09/30/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Organic, Semivolatiles

Group # WSCF130996

Analytical Batch 221631 (QC Batch: 221605) Test SW-846 8270D Semivolatiles
 Associated Samples 130996001

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
SAMPLE		Sample #130996001								
2-Fluorophenol	367-12-4				40.7	38 - 151				09/26/13
Phenol-d5	4165-62-2				50.1	38 - 153				09/26/13
Nitrobenzene-d5	4165-60-0				57.7	42 - 153				09/26/13
2-Methylnaphthalene-d10	7297-45-2				41.9	27 - 197				09/26/13
2-Fluorobiphenyl	321-60-8				47.2	34 - 160				09/26/13
2,4,6-Tribromophenol	118-79-6				21.9	21 - 147				09/26/13
Fluoranthene-d10	93951-69-0				19.6	39 - 168			X	09/26/13
Terphenyl-d14	98904-43-9				25.4	51 - 155			X	09/26/13
BLANK		QC Sample #98302								
2-Fluorophenol	367-12-4				119.2	38 - 151				09/26/13
Fluoranthene-d10	93951-69-0			ug/kg	114.3	39 - 168				09/26/13
Phenol-d5	4165-62-2				118.4	38 - 153				09/26/13
Nitrobenzene-d5	4165-60-0				111.5	42 - 153				09/26/13
2-Methylnaphthalene-d10	7297-45-2				117.9	27 - 197				09/26/13
2-Fluorobiphenyl	321-60-8				117.9	34 - 160				09/26/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Organic, Semivolatiles

Group # WSCF130996

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
2,4,6-Tribromophenol	118-79-6				101.1	21 - 147				09/26/13
Terphenyl-d14	98904-43-9				127.7	51 - 155				09/26/13
LCS			QC Sample #98303							
2-Fluorophenol	367-12-4			ug/kg	106.7	38 - 151				09/26/13
Phenol-d5	4165-62-2			ug/kg	106.3	38 - 153				09/26/13
Nitrobenzene-d5	4165-60-0			ug/kg	106.2	42 - 153				09/26/13
2,4,6-Tribromophenol	118-79-6			ug/kg	101.1	21 - 147				09/26/13
2-Fluorobiphenyl	321-60-8			ug/kg	104.9	34 - 160				09/26/13
Terphenyl-d14	98904-43-9			ug/kg	113.2	51 - 155				09/26/13
2-Methylnaphthalene-d10	7297-45-2			ug/kg	107.6	27 - 197				09/26/13
Fluoranthene-d10	93951-69-0			ug/kg	103	39 - 168				09/26/13
MS			QC Sample #98304							
			Original 130996001							
2-Fluorophenol	367-12-4			ug/kg	23	38 - 151			X	09/26/13
Phenol-d5	4165-62-2			ug/kg	26.3	38 - 153			X	09/26/13
Nitrobenzene-d5	4165-60-0			ug/kg	31.8	42 - 153			X	09/26/13
2,4,6-Tribromophenol	118-79-6			ug/kg	9.2	21 - 147			X	09/26/13
2-Fluorobiphenyl	321-60-8			ug/kg	22.2	34 - 160			X	09/26/13
Terphenyl-d14	98904-43-9			ug/kg	5.3	51 - 155			X	09/26/13
2-Methylnaphthalene-d10	7297-45-2			ug/kg	16.8	27 - 197			X	09/26/13
Fluoranthene-d10	93951-69-0			ug/kg	3.5	39 - 168			X	09/26/13

* - QC result out of range

n/a - Not Applicable

Quality Control Report

Attention Scot Fitzgerald
 Department Organic, Semivolatiles

Group # WSCF130996

Analyte	CAS #	Original Found	QC Found	Units	% Recov	Limits	RPD	RPD Limit	RQ	Analyzed
MSD		QC Sample #98305								
		Original	130996001					Paired	98304	
2-Fluorophenol	367-12-4			ug/kg	32.2	38 - 151	n/a		X	09/26/13
Phenol-d5	4165-62-2			ug/kg	39.2	38 - 153	n/a			09/26/13
Nitrobenzene-d5	4165-60-0			ug/kg	44	42 - 153	n/a			09/26/13
2,4,6-Tribromophenol	118-79-6			ug/kg	13.7	21 - 147	n/a		X	09/26/13
2-Fluorobiphenyl	321-60-8			ug/kg	31.6	34 - 160	n/a		X	09/26/13
Terphenyl-d14	98904-43-9			ug/kg	8.3	51 - 155	n/a		X	09/26/13
2-Methylnaphthalene-d10	7297-45-2			ug/kg	25.3	27 - 197	n/a		X	09/26/13
Fluoranthene-d10	93951-69-0			ug/kg	5.6	39 - 168	n/a		X	09/26/13

* - QC result out of range

n/a - Not Applicable

Tentatively Identified Peak Report

SEPTEMBER 30, 2013

Attention Scot Fitzgerald
Department Organic, Semivolatiles

Group # WSCF130996

Peak Name	CAS #	RT	RQ	Result	Units
130996001	B2RKF6				
Carbon Tetrachloride	56-23-5	4.8907		590	ug/kg
Trichloroethylene	79-01-6	5.4037		40	ug/kg
Chloriodomethane	593-71-5	5.6496		12	ug/kg
Tetrachloroethylene	127-18-4	6.54211		66	ug/kg
Nitric acid, butyl est	928-45-0	6.6596		79	ug/kg
1-Hexanol, 2-ethyl-	104-76-7	8.8989		15	ug/kg
Undecane	1120-21-4	9.7968		22	ug/kg
Nonane, 5-butyl-	17312-63-9	12.410		8.7	ug/kg
1-Propanol, 2,2-dimeth	3581-70-2	17.535		2.7	ug/kg

Attention: Scot Fitzgerald

Group #

WSCF130996

130996001

B2RKF6

Department Organic, Semivolatiles

- Analyte** Fluoranthene-d10 - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.
- Analyte** Terphenyl-d14 - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Attention: Scot Fitzgerald

Group #

WSCF130996

Quality Control Comments

Department Organic, Semivolatiles

98304 B2RKF6(130996001MS)

Analyte 2,4,6-Tribromophenol - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Analyte 2-Fluorobiphenyl - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Analyte 2-Fluorophenol - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Analyte 2-Methylnaphthalene-d10 - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Analyte Fluoranthene-d10 - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Analyte Nitrobenzene-d5 - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Analyte Phenol-d5 - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Analyte Terphenyl-d14 - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

98305 B2RKF6(130996001MSD)

Analyte 1,4-Dichlorobenzene - SW-846 8270D Semivolatiles
[1] Matrix Spike RPD outside established laboratory limits No flags assigned.

Analyte 2,4,6-Tribromophenol - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Analyte 2-Fluorobiphenyl - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Analyte 2-Fluorophenol - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Analyte 2-Methylnaphthalene-d10 - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Attention: Scot Fitzgerald

Group #

WSCF130996

Quality Control Comments

- Analyte** 2-Methylphenol - SW-846 8270D Semivolatiles
[1] Matrix Spike RPD outside established laboratory limits No flags assigned.
- Analyte** Fluoranthene-d10 - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.
- Analyte** Terphenyl-d14 - SW-846 8270D Semivolatiles
[1] Surrogate recovery outside of established laboratory control limits.

Attention: Scot Fitzgerald

Group #

WSCF130996

Quality Control Comments

Department Radiochemistry

97986	BLANK for HBN 221408 [RADP/809
Analyte	Americium-241 - Americium/Curium (AEA)
[1]	The blank is less than 2X the MDC and is acceptable.
Analyte	Uranium-234 - Uranium (AEA)
[1]	The blank is slightly above the MDC, but is much less than the RDL.
97988	B2RKF6(130996001DUP)
Analyte	Plutonium-239_240 - Plutonium (AEA)
[1]	The duplicate is outside of default RPD limits. RPD limit does not apply to results less than 5X the Minimum Detectable Concentration.
Analyte	Uranium-238 - Uranium (AEA)
[1]	The duplicate is outside of RPD limits. Inhomogeneity in soil and other solid matrix samples can lead to poor reproducibility.
[2]	The duplicate is outside of default RPD limits. RPD limit does not apply to results with greater than 20% counting uncertainty.
98060	LCS for HBN 221508 [RADP/8101]
Analyte	Gross Alpha - GAB Discrete analysis Alpha only
[1]	The LCS is outside of default limits. The LCS is within the range of 70-130% and is acceptable, per S&GRP SOW.

ATTACHMENT4

SAMPLE RECEIPT

Consisting of 4 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

ATTN: Scot Fitzgerald

Customer Code: CHPRC
CACN: 401639
Work Order #: 130996
Customer Work ID: F11-031-055
Due Date: 09/30/2013

The following samples were received from you on 9/13/2013 11:30:00 AM. 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
130996001	B2RKF6	OTHERSOLID	9/13/2013 10:45	9/13/2013 11:30
Procedure		Compound List		
Americium/Curium (AEA)		AM-241		
Dry Weight/Percent Moisture		% Moisture,% Solid		
GAB Discrete analysis Alpha only		Alpha		
GAB Discrete analysis Beta only		Beta		
Gamma Energy Analysis-general		Not a standard service list. There are too many compounds to list individually.		
ICP-2008 MS All possible metal		U		
Neptunium (AEA)		Np-237		
Plutonium (AEA)		Pu-238,Pu-239/240		
SW-846 8270D Semivolatiles		Not a standard service list. There are too many compounds to list individually.		
Strontium 89/90 (GPC/GEA)		SR89/90,Sr-85		
Uranium (AEA)		U-234,U-235,U-238		

Chain of Custody

CH2MHill Plateau Remediation Company		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		PAGE 2 OF 2	
COLLECTOR <i>Kaurk Claus Floyd</i>	COMPANY CONTACT EVANS, RT	TELEPHONE NO. 373-7924	PROJECT COORDINATOR EVANS, RT	PRICE CODE 9C	DATA TURNAROUND 15 Days / 15 Days
SAMPLING LOCATION 200-PW-10 GAC COMPOSITE	PROJECT DESIGNATION 200-PW-1 & 200-ZP-1 Sport GAC Canisters and Filters	FIELD LOGBOOK NO. <i>1407-20-991/92</i>	ACTUAL SAMPLE DEPTH <i>N/A</i>	SAF NO. F11-031	AIR QUALITY <input type="checkbox"/>
ICE CHEST NO.	FIELD LOGBOOK NO.	ACTUAL SAMPLE DEPTH	COA 302853ES10	METHOD OF SHIPMENT GOVERNMENT VEHICLE	ORIGINAL
SHIPPED TO Waste Sampling & Characterization	OFFSITE PROPERTY NO. N/A	BILL OF LADING/AIR BILL NO. N/A			

SPECIAL INSTRUCTIONS
 ** The CACN for all analytical work at WSCF Laboratory is 401639. ** The 200 Area S&GRP Characterization and Monitoring Sampling and Analysis GKI applies to this SAF. TRVL-13-092; COMPOSITE OF CANISTER AE-1104 AND AE-1082
 (1) 8270_SVOA_GCMS: COMMON {1,4-Dichlorobenzene, 2-methylphenol (cresol, o-)}; 8270_SVOA_GCMS: CH 01 {1,2-Dichlorobenzene, Bis(2-chloroethyl) ether, Hexachlorobutadiene, Hexachloroethane}; 8270_SVOA_GCMS: COMMON (Add-on) {3+4 Methylphenol (cresol, m+D)};
 (2) GAMMA_GS: COMMON; GAMMA_GS: COMMON (Add-on) (Protactinium-231); ALPHA_GRC: COMMON (Gross alpha); BETA_GRC: COMMON (Gross beta);
 PUISO_IE_PRECIP_AEA: COMMON; AMCMISO_IE_PRECIP_AEA: COMMON; NP237_IE_PRECIP_AEA: COMMON; SRTOT_SEP_PRECIP_GPC: COMMON; UISO_IE_PRECIP_AEA: COMMON;

TRVL-13-092