0092133

SAF-RC-055
100K Burial Grounds – Other Solid
In-Process
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 11/15/10
INITIAL/DATE

COMMENTS:

SDG K2133 SAF-RC-055

Rad only Chem only ☑ Rad & Chem

☑ Complete Partial

RECEIVED
NOV 19 2010
EDMC

Waste Site: 118-K-1 Burial Grounds

EBERLINE
SERVICES

EBERLINE ANALYTICAL CORPORATION
2030 Wright Avenue
Richmond, California 94804-3849
Phone (510) 235-2633 Fax (510) 235-0438
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September 7, 2010

9
RECEIVED
SEP 2010

Ms. Joan Kessner
Washington Closure Hanford
2620 Fermi Avenue
MSIN H4-21
Richland, WA 99352

Reference: **P.O. #S00W235A00**
Eberline Analytical S0-07-076-7039, SDG K2133

Dear Ms. Kessner:

Enclosed is a data report for one solid (other solid) sample designated under SAF No. RC-055 received at Eberline Analytical on July 15, 2010. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

N. Joseph Verville
Client Services Manager

NJV/ljb

Enclosure: Data Package

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K2133 was composed of one solid (other solid) sample designated under SAF No. RC-055 with a Project Designation of: 100K Burial Grounds-Other Solid In-Process.

Most MDA's were greater than their respective RDL's due to very small aliquots. The result units are pCi/sample.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist. The results were transmitted to WCH via e-mail on September 7, 2010.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analysis

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analysis

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analysis

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analysis

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

2.7 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.8 Isotopic Plutonium Analysis

The final plating solution from the alpha Pu chemistry was split prior to electroplating; half the solution was plated for alpha counting and the other half was used to prepare the beta Pu-241 planchet. As a consequence of the sample split, the apparent tracer yields are artificially low and the resultant MDA's are greater than the RDL. No other problems were encountered during the course of the analyses.

2.9 Plutonium-241 Analysis

The final plating solution from the alpha Pu chemistry was split prior to electroplating; half the solution was plated for alpha counting and the other half was used to prepare the beta Pu-241 planchet. As a consequence of the sample split, the apparent tracer yields are artificially low and the resultant MDA's are greater than the RDL. No other problems were encountered during the course of the analyses.

2.10 Americium-241 and Curium-243/244 Analysis

No problems were encountered during the course of the analysis.

2.11 Gamma Spectroscopy

No problems were encountered during the course of the analyses.

3.0 Case Narrative Certification Statement

"I 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 obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

N. Joseph Verville **Client Services Managers**	9/7/10 **Date**

E B E R L I N E A N A L Y T I C A L / R I C H M O N D
SAMPLE DELIVERY GROUP K2133

SDG	7039
Contact	N. Joseph Verville

Client	Hanford
Contract	No. S00W235A00
Case no	SDG_K2133

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

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VB

Prepared by

Reviewed by

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	09/07/10

SDG 7039
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K2133

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 09/07/10

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

SDG 7039
Contact N. Joseph Verville

LAB SAMPLE SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K2133

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S007076-01	J1B9T1	118-K-1 burial grounds	OTHER		RC-055	RC-055-045	07/13/10 14:10
S007076-02	Lab Control Sample		OTHER		RC-055		
S007076-03	Method Blank		OTHER		RC-055		
S007076-04	Duplicate (S007076-01)	118-K-1 burial grounds	OTHER		RC-055		07/13/10 14:10
S007076-05	Duplicate (S007076-01)	118-K-1 burial grounds	OTHER		RC-055		07/13/10 14:10

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

SDG 7039
Contact N. Joseph Verville

QC SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K2133

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7039	RC-055-045	J1B9T1	OTHER	100.0	112 g		07/15/10	2	S007076-01	7039-001
		Method Blank	OTHER						S007076-03	7039-003
		Lab Control Sample	OTHER						S007076-02	7039-002
		Duplicate (S007076-01)	OTHER	100.0	112 g		07/15/10	2	S007076-04	7039-004
		Duplicate (S007076-01)	OTHER	100.0	112 g		07/15/10	2	S007076-05	7039-005

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

SDG 7039
Contact N. Joseph Verville

PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K2133

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
PU	OTHER	Plutonium, Isotopic in Solids	7257-056	8.0	1			1	1	1/1		
TH	OTHER	Thorium, Isotopic in Solids	7257-056	8.0	1			1	1	1/1		
TP	OTHER	Americium 241/Curium in Solids	7257-056	8.0	1			1	1	1/1		
U	OTHER	Uranium, Isotopic in Solids	7257-056	8.0	1			1	1	1/1		
Beta Counting												
SR	OTHER	Total Strontium in Solids	7257-056	10.4	1			1	1	1/1		
TC	OTHER	Technetium 99 in Solids	7257-056	13.2	1			1	1	1/1		
Gamma Spectroscopy												
GAM	OTHER	Gamma Scan	7257-056	7.0	1			1	1	1/1		
Liquid Scintillation Counting												
C	OTHER	Carbon 14 in Solids	7257-056	10.0	1			1	1	1/1		
H	OTHER	Tritium in Solids	7257-056	10.0	1			1	1	1/1		
NI_L	OTHER	Nickel 63 in Solids	7257-056	11.2	1			1	1	1/1		
PU_L	OTHER	Plutonium 241 in Solids	7257-056	12.4	1			1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

SDG 7039
Contact N. Joseph Verville

LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K2133

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S007076-01	J1B9T1			7039-001	C		08/26/10	08/30/10	BW	Carbon 14 in Solids
07/13/10	118-K-1 burial grounds		OTHER	7039-001	GAM		08/10/10	08/11/10	CSS	Gamma Scan
07/15/10	RC-055-045	RC-055		7039-001	H		08/27/10	08/30/10	BW	Tritium in Solids
				7039-001	NI_L		08/23/10	08/26/10	BW	Nickel 63 in Solids
				7039-001	PU		08/27/10	08/30/10	BW	Plutonium, Isotopic in Solids
				7039-001	PU_L		08/31/10	09/01/10	BW	Plutonium 241 in Solids
				7039-001	SR		08/19/10	08/25/10	BW	Total Strontium in Solids
				7039-001	TC		08/28/10	09/03/10	BW	Technetium 99 in Solids
				7039-001	TH		09/01/10	09/03/10	BW	Thorium, Isotopic in Solids
				7039-001	TP		08/30/10	09/01/10	BW	Americium 241/Curium in Solids
				7039-001	U		09/01/10	09/03/10	BW	Uranium, Isotopic in Solids
S007076-02	Lab Control Sample			7039-002	C		08/26/10	08/30/10	BW	Carbon 14 in Solids
			OTHER	7039-002	GAM		08/04/10	08/11/10	CSS	Gamma Scan
		RC-055		7039-002	H		08/27/10	08/30/10	BW	Tritium in Solids
				7039-002	NI_L		08/23/10	08/26/10	BW	Nickel 63 in Solids
				7039-002	PU		08/27/10	08/30/10	BW	Plutonium, Isotopic in Solids
				7039-002	PU_L		08/31/10	09/01/10	BW	Plutonium 241 in Solids
				7039-002	SR		08/19/10	08/25/10	BW	Total Strontium in Solids
				7039-002	TC		08/27/10	09/03/10	BW	Technetium 99 in Solids
				7039-002	TH		09/01/10	09/03/10	BW	Thorium, Isotopic in Solids
				7039-002	TP		08/30/10	09/01/10	BW	Americium 241/Curium in Solids
				7039-002	U		09/01/10	09/03/10	BW	Uranium, Isotopic in Solids
S007076-03	Method Blank			7039-003	C		08/26/10	08/30/10	BW	Carbon 14 in Solids
			OTHER	7039-003	GAM		08/04/10	08/11/10	CSS	Gamma Scan
		RC-055		7039-003	H		08/27/10	08/30/10	BW	Tritium in Solids
				7039-003	NI_L		08/23/10	08/26/10	BW	Nickel 63 in Solids
				7039-003	PU		08/27/10	08/30/10	BW	Plutonium, Isotopic in Solids
				7039-003	PU_L		08/31/10	09/01/10	BW	Plutonium 241 in Solids
				7039-003	SR		08/19/10	08/25/10	BW	Total Strontium in Solids
				7039-003	TC		08/27/10	09/03/10	BW	Technetium 99 in Solids
				7039-003	TH		09/01/10	09/03/10	BW	Thorium, Isotopic in Solids
				7039-003	TP		08/30/10	09/01/10	BW	Americium 241/Curium in Solids
				7039-003	U		09/01/10	09/03/10	BW	Uranium, Isotopic in Solids

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

SDG 7039
Contact N. Joseph Verville

WORK SUMMARY, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K2133

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S007076-04	Duplicate (S007076-01)			7039-004	C		08/26/10	08/30/10	BW	Carbon 14 in Solids
07/13/10	118-K-1 burial grounds		OTHER	7039-004	H		08/27/10	08/30/10	BW	Tritium in Solids
07/15/10		RC-055		7039-004	NI_L		08/23/10	08/26/10	BW	Nickel 63 in Solids
				7039-004	PU		08/27/10	08/30/10	BW	Plutonium, Isotopic in Solids
				7039-004	PU_L		09/01/10	09/01/10	BW	Plutonium 241 in Solids
				7039-004	SR		08/19/10	08/25/10	BW	Total Strontium in Solids
				7039-004	TC		08/31/10	09/03/10	BW	Technetium 99 in Solids
				7039-004	TH		09/01/10	09/03/10	BW	Thorium, Isotopic in Solids
				7039-004	TP		08/30/10	09/01/10	BW	Americium 241/Curium in Solids
				7039-004	U		09/01/10	09/03/10	BW	Uranium, Isotopic in Solids
S007076-05	Duplicate (S007076-01)			7039-005	GAM		08/10/10	08/11/10	CSS	Gamma Scan
07/13/10	118-K-1 burial grounds		OTHER							
07/15/10		RC-055								

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
C	RC-055	Carbon 14 in Solids	C14_COX_LSC	1			1	1	1	4
GAM	RC-055	Gamma Scan	GAMMA_GS	1			1	1	1	4
H	RC-055	Tritium in Solids	TRITIUM_COX_LSC	1			1	1	1	4
NI_L	RC-055	Nickel 63 in Solids	NI63_LSC	1			1	1	1	4
PU	RC-055	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	1			1	1	1	4
PU_L	RC-055	Plutonium 241 in Solids	PU241_IE_LSC	1			1	1	1	4
SR	RC-055	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	1			1	1	1	4
TC	RC-055	Technetium 99 in Solids	TC99_TR_SEP_GPC	1			1	1	1	4
TH	RC-055	Thorium, Isotopic in Solids	THISO_IE_PLATE_AEA	1			1	1	1	4
TP	RC-055	Americium 241/Curium in Solids	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
U	RC-055	Uranium, Isotopic in Solids	UISO_PLATE_AEA	1			1	1	1	4
TOTALS				11			11	11	11	44

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

7039-003 Method Blank

METHOD BLANK

SDG	7039	Client/Case no	Hanford	SDG_K2133	
Contact	N. Joseph Verville	Contract	No. S00W235A00		
Lab sample id	S007076-03	Client sample id	Method Blank		
Dept sample id	7039-003	Material/Matrix		OTHER	
		SAF No	RC-055		

ANALYTE	CAS NO	RESULT pCi/smpl	2σ ERR (COUNT)	MDA pCi/smpl	RDL pCi/smpl	QUALI-FIERS	TEST
Tritium	10028-17-8	817	1200	2100	400	U	H
Carbon 14	14762-75-5	-399	930	1600	50	U	C
Nickel 63	13981-37-8	78.1	210	360	30	U	NI_L
Total Strontium	SR-RAD	-11.1	15	32	1.0	U	SR
Americium 241	14596-10-2	8.32	25	46	1.0	U	TP
Curium 242	15510-73-3	0	8.3	32	1.0	U	TP
Curium 243/244	CM-243/244	16.6	25	40	1.0	U	TP
Technetium 99	14133-76-7	22.5	50	77	15	U	TC
Thorium 228	14274-82-9	33.2	33	61	1.0	U	TH
Thorium 230	14269-63-7	-11.0	44	93	1.0	U	TH
Thorium 232	TH-232	0	11	42	1.0	U	TH
Uranium 233/234	U-233/234	0	5.8	22	1.0	U	U
Uranium 235	15117-96-1	3.53	7.1	27	1.0	U	U
Uranium 238	U-238	0	5.8	22	1.0	U	U
Plutonium 238	13981-16-3	8.00	32	77	1.0	U	PU
Plutonium 239/240	PU-239/240	-8.00	16	61	1.0	U	PU
Plutonium 241	14119-32-5	436	1500	2500	15	U	PU_L
Cobalt 60	10198-40-0	U		15	0.050	U	GAM
Niobium 94	14681-63-1	U		12		U	GAM
Ruthenium 106	13967-48-1	U		130		U	GAM
Rhodium 106	14234-34-5	U		130		U	GAM
Silver 108m	14391-65-2	U		11		U	GAM
Silver 110m	14391-76-5	U		19		U	GAM
Antimony 125	14234-35-6	U		32		U	GAM
Tin 126	15832-50-5	U		210		U	GAM
Barium 133	13981-41-4	U		16		U	GAM
Cesium 134	13967-70-9	U		18		U	GAM
Cesium 137	10045-97-3	U		34	0.10	U	GAM
Cerium 144	14762-78-8	U		74		U	GAM

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

7039-003 Method Blank

BLANK, cont.

SDG	7039	Client/Case no	Hanford	SDG K2133	
Contact	N. Joseph Verville	Contract	No. S00W235A00		
Lab sample id	S007076-03	Client sample id	Method Blank		
Dept sample id	7039-003	Material/Matrix		OTHER	
		SAF No	RC-055		

ANALYTE	CAS NO	RESULT pCi/smpl	2σ ERR (COUNT)	MDA pCi/smpl	RDL pCi/smpl	QUALI-FIERS	TEST
Praseodymium 144	14119-05-2	U		74		U	GAM
Europium 152	14683-23-9	U		46	0.10	U	GAM
Europium 154	15585-10-1	U		44	0.10	U	GAM
Europium 155	14391-16-3	U		34	0.10	U	GAM
Americium 241	14596-10-2	U		15		U	GAM

QC-BLANK #74037

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

7039-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7039

Contact N. Joseph Verville

Client/Case no Hanford SDG K2133

Contract No. S00W235A00

Lab sample id S007076-02

Dept sample id 7039-002

Client sample id Lab Control Sample

Material/Matrix OTHER

SAF No RC-055

ANALYTE	RESULT pCi/smpl	2σ ERR (COUNT)	MDA pCi/smpl	RDL pCi/smpl	QUALI-FIERS	TEST	ADDED pCi/smpl	2σ ERR pCi/smpl	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	232000	5700	2000	400		H	241000	9600	96	84-116	80-120
Carbon 14	677000	14000	3800	50		C	709000	28000	95	84-116	80-120
Nickel 63	23900	680	330	30		NI_L	27200	1100	88	84-116	80-120
Total Strontium	1130	65	30	1.0		SR	1100	44	103	81-119	80-120
Americium 241	1410	190	41	1.0		TP	1260	50	112	73-127	80-120
Curium 243/244	1180	170	47	1.0		TP	1060	42	111	72-128	80-120
Technetium 99	24600	480	73	15		TC	21800	870	113	77-123	80-120
Thorium 230	2330	330	110	1.0		TH	2360	94	99	75-125	80-120
Uranium 233/234	1070	160	87	1.0		U	1160	46	92	76-124	80-120
Uranium 235	893	140	31	1.0		U	942	38	95	74-126	80-120
Uranium 238	1210	170	84	1.0		U	1260	50	96	76-124	80-120
Plutonium 238	1510	240	57	1.0		PU	1440	58	105	71-129	80-120
Plutonium 239/240	1630	260	57	1.0		PU	1650	66	99	73-127	80-120
Plutonium 241	35200	2500	2800	15		PU_L	40800	1600	86	81-119	80-120
Cobalt 60	542	19	9.8	0.050		GAM	556	22	97	87-113	80-120
Cesium 137	588	17	11	0.10		GAM	572	23	103	87-113	80-120

QC-LCS #74036

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

7039-004 J1B9T1

DUPLICATE

SDG	7039			Client/Case no	Hanford SDG K2133
Contact	N. Joseph Verville			Contract	No. S00W235A00
DUPLICATE		ORIGINAL			
Lab sample id	S007076-04	Lab sample id	S007076-01	Client sample id	J1B9T1
Dept sample id	7039-004	Dept sample id	7039-001	Location/Matrix	118-K-1 burial grounds OTHER
		Received	07/15/10	Collected/Weight	07/13/10 14:10 112 g
% solids	100.0	% solids	100.0	Custody/SAF No	RC-055-045 RC-055

ANALYTE	DUPLICATE pCi/smpl	2σ ERR (COUNT)	MDA pCi/smpl	RDL pCi/smpl	QUALI-FIERS	TEST	ORIGINAL pCi/smpl	2σ ERR (COUNT)	MDA pCi/smpl	QUALI-FIERS	RPD %	3σ TOT	DER σ
Tritium	6550	1500	2000	400		H	7360	1600	2100		12	52	0.7
Carbon 14	49100	1900	1500	50		C	58200	2100	1600		17	23	2.2
Nickel 63	31300	740	300	30		NI_L	31900	750	310		2	24	0.2
Total Strontium	48.7	17	25	1.0		SR	43.1	17	26		12	82	0.4
Americium 241	17.5	21	34	1.0	U	TP	27.6	21	33	U	-		0.7
Curium 242	-4.29	8.6	33	1.0	U	TP	4.23	8.5	32	U	-		1.4
Curium 243/244	24.6	28	47	1.0	U	TP	13.9	21	43	U	-		0.6
Technetium 99	15.4	24	72	15	U	TC	41.4	53	84	U	-		0.9
Thorium 228	22.9	34	63	1.0	U	TH	36.9	44	81	U	-		0.5
Thorium 230	11.4	46	97	1.0	U	TH	14.7	59	120	U	-		0.1
Thorium 232	5.69	23	44	1.0	U	TH	29.3	30	56	U	-		1.2
Uranium 233/234	17.7	12	19	1.0	U	U	21.2	17	32	U	-		0.3
Uranium 235	0	4.8	18	1.0	U	U	0	10	39	U	-		0
Uranium 238	19.7	12	15	1.0		U	25.4	17	32	U	25	139	0.5
Plutonium 238	-7.98	16	61	1.0	U	PU	-8.53	34	82	U	-		0
Plutonium 239/240	0	16	61	1.0	U	PU	8.52	17	65	U	-		0.7
Plutonium 241	367	1500	2500	15	U	PU_L	207	1500	2500	U	-		0.2

QC-DUP#1 74038

100K Burial Grounds - Other Solid In-Process

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

7039-005 J1B9T1

DUPLICATE

SDG	7039			Client/Case no	Hanford SDG K2133
Contact	N. Joseph Verville			Contract	No. S00W235A00
	DUPLICATE		ORIGINAL		
Lab sample id	S007076-05	Lab sample id	S007076-01	Client sample id	J1B9T1
Dept sample id	7039-005	Dept sample id	7039-001	Location/Matrix	118-K-1 burial grounds OTHER
		Received	07/15/10	Collected/Weight	07/13/10 14:10 112 g
% solids	100.0	% solids	100.0	Custody/SAF No	RC-055-045 RC-055

ANALYTE	DUPLICATE pCi/smpl	2σ ERR (COUNT)	MDA pCi/smpl	RDL pCi/smpl	QUALI-FIERS	TEST	ORIGINAL pCi/smpl	2σ ERR (COUNT)	MDA pCi/smpl	QUALI-FIERS	RPD %	3σ TOT	DER σ
Cobalt 60	1060	82	47	0.050		GAM	1060	72	41		0	21	0
Niobium 94	U		48		U	GAM	U		37	U	-		0.4
Ruthenium 106	U		380		U	GAM	U		250	U	-		0.6
Rhodium 106	U		380		U	GAM	U		250	U	-		0.6
Silver 108m	U		30		U	GAM	U		23	U	-		0.4
Silver 110m	U		66		U	GAM	U		51	U	-		0.4
Antimony 125	U		94		U	GAM	U		61	U	-		0.6
Tin 126	U		140		U	GAM	U		31	U	-		1.5
Barium 133	U		51		U	GAM	U		36	U	-		0.5
Cesium 134	U		55		U	GAM	U		48	U	-		0.2
Cesium 137	U		100	0.10	U	GAM	U		71	U	-		0.5
Cerium 144	U		230		U	GAM	U		120	U	-		0.8
Praseodymium 144	U		230		U	GAM	U		120	U	-		0.8
Europium 152	U		130	0.10	U	GAM	U		160	U	-		0.3
Europium 154	U		130	0.10	U	GAM	U		89	U	-		0.5
Europium 155	U		100	0.10	U	GAM	U		64	U	-		0.6
Americium 241	U		54		U	GAM	U		34	U	-		0.6

QC-DUP#1 74237

100K Burial Grounds - Other Solid In-Process

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

7039-001 J1B9T1

DATA SHEET

SDG	7039	Client/Case no	Hanford	SDG K2133	
Contact	N. Joseph Verville	Contract	No. S00W235A00		
Lab sample id	S007076-01	Client sample id	J1B9T1		
Dept sample id	7039-001	Location/Matrix	118-K-1 burial grounds	OTHER	
Received	07/15/10	Collected/Weight	07/13/10 14:10	112 g	
% solids	100.0	Custody/SAF No	RC-055-045	RC-055	

ANALYTE	CAS NO	RESULT pCi/smpl	2σ ERR (COUNT)	MDA pCi/smpl	RDL pCi/smpl	QUALI-FIERS	TEST
Tritium	10028-17-8	7360	1600	2100	400		H
Carbon 14	14762-75-5	58200	2100	1600	50		C
Nickel 63	13981-37-8	31900	750	310	30		NI_L
Total Strontium	SR-RAD	43.1	17	26	1.0		SR
Americium 241	14596-10-2	27.6	21	33	1.0	U	TP
Curium 242	15510-73-3	4.23	8.5	32	1.0	U	TP
Curium 243/244	CM-243/244	13.9	21	43	1.0	U	TP
Technetium 99	14133-76-7	41.4	53	84	15	U	TC
Thorium 228	14274-82-9	36.9	44	81	1.0	U	TH
Thorium 230	14269-63-7	14.7	59	120	1.0	U	TH
Thorium 232	TH-232	29.3	30	56	1.0	U	TH
Uranium 233/234	U-233/234	21.2	17	32	1.0	U	U
Uranium 235	15117-96-1	0	10	39	1.0	U	U
Uranium 238	U-238	25.4	17	32	1.0	U	U
Plutonium 238	13981-16-3	-8.53	34	82	1.0	U	PU
Plutonium 239/240	PU-239/240	8.52	17	65	1.0	U	PU
Plutonium 241	14119-32-5	207	1500	2500	15	U	PU_L
Cobalt 60	10198-40-0	1060	72	41	0.050		GAM
Niobium 94	14681-63-1	U		37		U	GAM
Ruthenium 106	13967-48-1	U		250		U	GAM
Rhodium 106	14234-34-5	U		250		U	GAM
Silver 108m	14391-65-2	U		23		U	GAM
Silver 110m	14391-76-5	U		51		U	GAM
Antimony 125	14234-35-6	U		61		U	GAM
Tin 126	15832-50-5	U		31		U	GAM
Barium 133	13981-41-4	U		36		U	GAM
Cesium 134	13967-70-9	U		48		U	GAM
Cesium 137	10045-97-3	U		71	0.10	U	GAM

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

7039-001 J1B9T1

DATA SHEET, cont

SDG	7039	Client/Case no	Hanford	SDG K2133
Contact	N. Joseph Verville	Contract	No. S00W235A00	
Lab sample id	S007076-01	Client sample id	J1B9T1	
Dept sample id	7039-001	Location/Matrix	118-K-1 burial grounds	OTHER
Received	07/15/10	Collected/Weight	07/13/10 14:10	112 g
% solids	100.0	Custody/SAF No	RC-055-045	RC-055

ANALYTE	CAS NO	RESULT pCi/smpl	2σ ERR (COUNT)	MDA pCi/smpl	RDL pCi/smpl	QUALI-FIERS	TEST
Cerium 144	14762-78-8	U		120		U	GAM
Praseodymium 144	14119-05-2	U		120		U	GAM
Europium 152	14683-23-9	U		160	0.10	U	GAM
Europium 154	15585-10-1	U		89	0.10	U	GAM
Europium 155	14391-16-3	U		64	0.10	U	GAM
Americium 241	14596-10-2	U		34		U	GAM

100K Burial Grounds - Other Solid In-Process

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

Test PU Matrix OTHER
SDG 7039
Contact N. Joseph Verville

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K2133

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Plutonium 238		Plutonium 239/240	
Preparation batch 7257-056								
S007076-01			7039-001	J1B9T1	U		8.52	U
S007076-02			7039-002	Lab Control Sample	ok		ok	
S007076-03			7039-003	Method Blank	8.00	U	U	
S007076-04			7039-004	Duplicate (S007076-01)	-	U	-	U
Nominal values and limits from method				RDLs (pCi/smpl)	1.0		1.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/smpl	ALIQ sample	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7257-056			2σ prep error 8.0 %	Reference Lab Notebook No. 7257 pg.056												
S007076-01			J1B9T1	82	0.0045			31		117			45	08/27/10	08/27	SS-031
S007076-02			Lab Control Sample	57	0.0040			40		117				08/27/10	08/27	SS-032
S007076-03			Method Blank	77	0.0040			38		118				08/27/10	08/27	SS-033
S007076-04			Duplicate (S007076-01)	61	0.0045			34		118			45	08/27/10	08/27	SS-034
Nominal values and limits from method				1.0	0.0040			30-110		100	100		180			

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
	SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 1
	CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 12
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	69	±	24
	YIELD	36	±	8

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

Test TH Matrix OTHER
SDG 7039
Contact N. Joseph Verville

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K2133

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Thorium 228		Thorium 230		Thorium 232	
Preparation batch 7257-056										
S007076-01			7039-001	J1B9T1	36.9	U	14.7	U	29.3	U
S007076-02			7039-002	Lab Control Sample			ok			
S007076-03			7039-003	Method Blank	33.2	U	U		U	
S007076-04			7039-004	Duplicate (S007076-01)	-	U	-	U	-	U
Nominal values and limits from method				RDLs (pCi/smpl)	1.0		1.0		1.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/smpl	ALIQ sample	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7257-056			2σ prep error 8.0 %	Reference Lab Notebook No. 7257 pg.056												
S007076-01			J1B9T1	120	0.0022			54		152			50	08/30/10	09/01	SS-030
S007076-02			Lab Control Sample	110	0.0020			77		153				08/30/10	09/01	SS-031
S007076-03			Method Blank	93	0.0020			86		153				08/30/10	09/01	SS-032
S007076-04			Duplicate (S007076-01)	97	0.0022			77		153			50	08/30/10	09/01	SS-033
Nominal values and limits from method				1.0	0.0020			30-110		150			180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1
	CP-900	Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 5
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 100 ± 25
YIELD 74 ± 27

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

Test	TP
Matrix	OTHER
SDG	7039
Contact	N. Joseph Verville

LAB METHOD SUMMARY

AMERICIUM 241/CURIUM IN SOLIDS

ALPHA SPECTROSCOPY

Client	Hanford
Contract	No. S00W235A00
Contract	SDG K2133

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Americium 241		Curium 243/244	
Preparation batch 7257-056								
S007076-01			7039-001	J1B9T1	27.6	U	13.9	U
S007076-02			7039-002	Lab Control Sample	ok		ok	
S007076-03			7039-003	Method Blank	8.32	U	16.6	U
S007076-04			7039-004	Duplicate (S007076-01)	-	U	-	U
Nominal values and limits from method				RDLs (pCi/smpl)	1.0		1.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/smpl	ALIQ sample	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7257-056			2σ prep error 8.0 %	Reference Lab Notebook No. 7257 pg.056												
S007076-01			J1B9T1	43	0.0045			88		105			48	08/28/10	08/30	SS-031
S007076-02			Lab Control Sample	47	0.0040			81		105				08/28/10	08/30	SS-032
S007076-03			Method Blank	46	0.0040			84		106				08/28/10	08/30	SS-033
S007076-04			Duplicate (S007076-01)	47	0.0045			88		106			48	08/28/10	08/30	SS-034
Nominal values and limits from method				1.0	0.0040			30-110		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 1
	CP-963	Americium and Curium in Water and Dissolved Samples by Extraction Chromatography, rev 6
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD FOR 4 SAMPLES				
MDA	46	±	3.8
YIELD	85	±	7

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

Test U Matrix OTHER
SDG 7039
Contact N. Joseph Verville

LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K2133

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	1: Uranium 233/234		2: Uranium 235		3: Uranium 238		RESULT RATIOS (%) 1+3	2σ	2+3	2σ
Preparation batch 7257-056														
S007076-01			7039-001	J1B9T1	21.2	U	U		25.4	U				
S007076-02			7039-002	Lab Control Sample	ok		ok		ok					
S007076-03			7039-003	Method Blank	U		3.53	U	U					
S007076-04			7039-004	Duplicate (S007076-01)	-	U	-	U	ok		90	82	0	24
Nominal values and limits from method				RDLs (pCi/smpl)	1.0		1.0		1.0		100		4	
										Averages	90		0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/smpl	ALIQ sample	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7257-056			2σ prep error 8.0 %	Reference Lab Notebook No. 7257 pg.056												
S007076-01			J1B9T1	39	0.0045			68		100			50	08/31/10	09/01	SS-051
S007076-02			Lab Control Sample	87	0.0040			91		100				08/31/10	09/01	SS-052
S007076-03			Method Blank	27	0.0040			89		131				08/31/10	09/01	SS-054
S007076-04			Duplicate (S007076-01)	19	0.0045			85		146			50	08/31/10	09/01	SS-056
Nominal values and limits from method				1.0	0.0040			30-110		100	100		180			

PROCEDURES	REFERENCE	UISO_PLATE_AEA
	SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 1
	CP-921	Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 5
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 43 ± 61
YIELD 83 ± 21

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

Test	SR
Matrix	OTHER
SDG	7039
Contact	N. Joseph Verville

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

Client	Hanford
Contract	No. S00W235A00
Contract	SDG K2133

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium
Preparation batch 7257-056					
S007076-01			7039-001	J1B9T1	43.1
S007076-02			7039-002	Lab Control Sample	ok
S007076-03			7039-003	Method Blank	U
S007076-04			7039-004	Duplicate (S007076-01)	ok
Nominal values and limits from method				RDLs (pCi/smpl)	1.0

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/smpl	ALIQ sample	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7257-056			2σ prep error 10.4 % Reference Lab Notebook No. 7257 pg.056													
S007076-01			J1B9T1	26	0.0089			89		100			37	08/18/10	08/19	GRB-230
S007076-02			Lab Control Sample	30	0.0080			92		100				08/18/10	08/19	GRB-231
S007076-03			Method Blank	32	0.0080			98		100				08/18/10	08/19	GRB-227
S007076-04			Duplicate (S007076-01)	25	0.0089			97		100			37	08/18/10	08/19	GRB-230
Nominal values and limits from method				1.0	0.0080			40-110		100			180			

PROCEDURES	REFERENCE	
	SRTOT_SEP_PRECIP_GPC	
	SPP-071	Soil Dissolution, > 1.0g Aliquot, rev 1
	CP-383	Strontium in Dissolved Solid of < 5.0g Aliquot, rev 4

AVERAGES ± 2 SD FOR 4 SAMPLES			
MDA	28	±	6.6
YIELD	94	±	8

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-LMS
Version	3.06
Report date	09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

Test TC Matrix OTHER
SDG 7039
Contact N. Joseph Verville

LAB METHOD SUMMARY

TECHNETIUM 99 IN SOLIDS

BETA COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K2133

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Technetium 99	
Preparation batch 7257-056						
S007076-01			7039-001	J1B9T1	41.4	U
S007076-02			7039-002	Lab Control Sample	ok	
S007076-03			7039-003	Method Blank	22.5	U
S007076-04			7039-004	Duplicate (S007076-01)	-	U

Nominal values and limits from method RDLs (pCi/smpl) 15

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/smpl	ALIQ sample	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7257-056			2σ prep error 13.2 % Reference Lab Notebook No. 7257 pg.056													
S007076-01			J1B9T1	84	0.0051			90		102			46	08/24/10	08/28	GRB-230
S007076-02			Lab Control Sample	73	0.0050			96		100				08/24/10	08/27	GRB-202
S007076-03			Method Blank	77	0.0050			94		100				08/24/10	08/27	GRB-204
S007076-04			Duplicate (S007076-01)	72	0.0051			92		120			49	08/24/10	08/31	GRB-227
Nominal values and limits from method				15	0.0050			30-110		50			180			

PROCEDURES	REFERENCE	TC99_TR_SEP_GPC
	SPP-062	Sample Aliquoting, rev 1
	CP-021	Preparation of Tc-99m Tracer, rev 6
	CP-431	Technetium-99 Purification of Soil or Resin by Extraction Chromatography, rev 8

AVERAGES ± 2 SD FOR 4 SAMPLES				
	MDA	76	±	11
	YIELD	93	±	5

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

Test GAM Matrix OTHER
SDG 7039
Contact N. Joseph Verville

LAB METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K2133

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Cobalt 60	Cesium 137
Preparation batch 7257-056						
S007076-01			7039-001	J1B9T1	1060	U
S007076-02			7039-002	Lab Control Sample	ok	ok
S007076-03			7039-003	Method Blank	U	U
S007076-05			7039-005	Duplicate (S007076-01)	ok	- U
Nominal values and limits from method				RDLs (pCi/smpl)	0.050	0.10

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/smpl	ALIQ sample	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7257-056			2σ prep error 7.0 %	Reference Lab Notebook No. 7257 pg.056												
S007076-01			J1B9T1	90	0.396					111			28	07/30/10	08/10	01,01,00
S007076-02			Lab Control Sample	9.8	0.390					948				07/30/10	08/04	JR,04,00
S007076-03			Method Blank	29	0.390					867				07/30/10	08/04	JR,06,00
S007076-05			Duplicate (S007076-01)	120	0.396					103			28	07/30/10	08/10	MB,06,00
Nominal values and limits from method				0.050	0.390					100			180			

PROCEDURES	REFERENCE	GAMMA_GS
	SPP-100	Preparation of Sample for Gamma Spectroscopy, rev 0

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 62 ± 100
YIELD ____ ± ____

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

Test C Matrix OTHER
SDG 7039
Contact N. Joseph Verville

LAB METHOD SUMMARY

CARBON 14 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K2133

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Carbon 14
Preparation batch 7257-056					
S007076-01			7039-001	J1B9T1	58200
S007076-02			7039-002	Lab Control Sample	ok
S007076-03			7039-003	Method Blank	U
S007076-04			7039-004	Duplicate (S007076-01)	ok
Nominal values and limits from method				RDLs (pCi/smpl)	50

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/smpl	ALIQ sample	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7257-056			2σ prep error 10.0 % Reference Lab Notebook No. 7257 pg.056													
S007076-01			J1B9T1	1600	9.0E-4			100		50			44	08/24/10	08/26	LSC-006
S007076-02			Lab Control Sample	3800	9.0E-4			100		10				08/24/10	08/26	LSC-006
S007076-03			Method Blank	1600	9.0E-4			100		50				08/24/10	08/26	LSC-006
S007076-04			Duplicate (S007076-01)	1500	0.0010			100		50			44	08/24/10	08/26	LSC-006
Nominal values and limits from method				50	9.0E-4					10			180			

PROCEDURES	REFERENCE	C14_COX_LSC
	CP-251	Tritium/Carbon-14 Oxidation, rev 11

AVERAGES ± 2 SD FOR 4 SAMPLES			
MDA	2100	±	2200
YIELD	100	±	0

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

Test H Matrix OTHER
SDG 7039
Contact N. Joseph Verville

LAB METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K2133

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7257-056						
S007076-01			7039-001	J1B9T1	7360	
S007076-02			7039-002	Lab Control Sample	ok	
S007076-03			7039-003	Method Blank	817	U
S007076-04			7039-004	Duplicate (S007076-01)	ok	

Nominal values and limits from method RDLs (pCi/smpl) 400

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/smpl	ALIQ sample	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7257-056			2σ prep error 10.0 %	Reference Lab Notebook No. 7257 pg.056												
S007076-01			J1B9T1	2100	9.0E-4			100		50			45	08/24/10	08/27	LSC-006
S007076-02			Lab Control Sample	2000	9.0E-4			100		50				08/24/10	08/27	LSC-006
S007076-03			Method Blank	2100	9.0E-4			100		50				08/24/10	08/27	LSC-006
S007076-04			Duplicate (S007076-01)	2000	0.0010			100		50			45	08/24/10	08/27	LSC-006
Nominal values and limits from method				400	9.0E-4					25			180			

PROCEDURES REFERENCE TRITIUM_COX_LSC
CP-251 Tritium/Carbon-14 Oxidation, rev 11

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 2000 ± 120
YIELD 100 ± 0

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/07/10

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

Test NI L Matrix OTHER
SDG 7039
Contact N. Joseph Verville

LAB METHOD SUMMARY

NICKEL 63 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K2133

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Nickel 63	
Preparation batch 7257-056						
S007076-01			7039-001	J1B9T1	31900	
S007076-02			7039-002	Lab Control Sample	ok	
S007076-03			7039-003	Method Blank	78.1	U
S007076-04			7039-004	Duplicate (S007076-01)	ok	
Nominal values and limits from method				RDLs (pCi/smpl)	30	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/smpl	ALIQ smpl	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7257-056			2σ prep error 11.2 %	Reference Lab Notebook No. 7257 pg.056												
S007076-01			J1B9T1	310	0.0045			100		50			41	08/20/10	08/23	LSC-007
S007076-02			Lab Control Sample	330	0.0040			101		50				08/20/10	08/23	LSC-007
S007076-03			Method Blank	360	0.0040			93		50				08/20/10	08/23	LSC-007
S007076-04			Duplicate (S007076-01)	300	0.0045			100		50			41	08/20/10	08/23	LSC-007
Nominal values and limits from method				30	0.0040			40-110		25			180			

PROCEDURES	REFERENCE	NI63_LSC
	SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 1
	CP-003	Addition of Carriers and Tracers, rev 9
	CP-280	Nickel-63 Purification, rev 5

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 320 ± 53
YIELD 98 ± 7

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LMS
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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K2133

Test PU L Matrix OTHER
SDG 7039
Contact N. Joseph Verville

LAB METHOD SUMMARY

PLUTONIUM 241 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K2133

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Plutonium 241	
Preparation batch 7257-056						
S007076-01			7039-001	J1B9T1	207	U
S007076-02			7039-002	Lab Control Sample	ok	
S007076-03			7039-003	Method Blank	436	U
S007076-04			7039-004	Duplicate (S007076-01)	-	U

Nominal values and limits from method RDLs (pCi/smpl) 15

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/smpl	ALIQ sample	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7257-056 2σ prep error 12.4 % Reference Lab Notebook No. 7257 pg.056																
S007076-01			J1B9T1	2500	0.0045			33		50			49	08/27/10	08/31	LSC-004
S007076-02			Lab Control Sample	2800	0.0040			33		50				08/27/10	08/31	LSC-004
S007076-03			Method Blank	2500	0.0040			37		50				08/27/10	08/31	LSC-004
S007076-04			Duplicate (S007076-01)	2500	0.0045			33		50			50	08/27/10	09/01	LSC-004
Nominal values and limits from method				15	0.0040			30-110		50			180			

PROCEDURES	REFERENCE	PU241_IE_LSC
	SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 1
	CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 12
	CP-008	Heavy Element Electroplating, rev 13
	RP-948	Plutonium-241 by Liquid Scintillation Counting, rev 4

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 2600 ± 300
YIELD 34 ± 4

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Protocol Hanford
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 09/07/10

SDG 7039
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K2133

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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Form DVD-RG
Version 3.06
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SDG 7039
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K2133

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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REPORT GUIDE

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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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GUIDE, cont.

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DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

SDG 7039
Contact N. Joseph Verville

REPORT GUIDE

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MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

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Contact N. Joseph Verville

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METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1÷3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Washington Closure Hanford	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	RC-055-045	Page 1 of 1

Collector: Garrett Taysom	Company Contact: D. Bowers	Telephone No.: 509-531-0701	Project Coordinator: KESSNER, JH
Price Code: 9L	Data Turnaround: ~~21~~ 10 Days 7-13-10 45		
Project Designation: 100K Burial Grounds - Other Solid In-Process	Sampling Location: 118-K-1 burial grounds K2133 (7039)	SAF No.: RC-055	
Ice Chest No.: GWSC – 13	Field Logbook No.: EL-1602-7	COA: R118K12600	Method of Shipment: Fed Ex
Shipped To: EBERLINE SERVICES LIONVILLE	Offsite Property No.: A100246	Bill of Lading/Air Bill No.: See DSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS

Radioactive

Special Handling and/or Storage

N/A

Preservation	Cool 4C	None										
Type of Container	G P	Poly Bag	DXB									
No. of Container(s)	1	~~1~~ 2	7-13-10									
Volume	60mL	2000mL										
SAMPLE ANALYSIS	See item (1) in Special Instructions. *	See item (2) in Special Instructions.										

Sample No.	Matrix *	Sample Date	Sample Time										
J1B9T1	OTHER SOLID	7-13-10	1410	X	X	DXB	7-13-10						

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Garrett Taysom	7-13-10 1410	Doug Bowers/Doug Bowers	7-13-10/1410
Doug Bowers/Doug Bowers	7-13-10/1625	Jen Russell Jen Russell	7/13/10 1625
Jen Russell Jen Russell	WCH 7/14/10 1000	Fed Ex	
FED EX		M. MATTHAUAN	07/15/10 09:20

SPECIAL INSTRUCTIONS

Add Thorium 228, 230, 232 to analysis. Trans ship sample after being ashed to Lionville to have ICP metals run on it. Sample time and date will reflect when sample were turned over to AFS personal. Contact Joan Kessner with any questions.

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc}; Mercury - 7471 - (CV)
(2) AB List Radionuclide Analysis {Americium-241, Curium-243 244}; AB List Radionuclide Analysis {Americium-241, Antimony-125, Barium-133, Cerium-144, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Preseodymium-144, Rhodium-106, Ruthenium-106, Silver-108 metastable, Silver-110 metastable, Tin-126}; AB List Radionuclide Analysis {Nickel-63}; AB List Radionuclide Analysis {Carbon-14}; AB List Radionuclide Analysis {Tritium}; AB List Radionuclide Analysis {Technetium-99}; AB List Radionuclide Analysis {Total beta radiostrontium}; AB List Radionuclide Analysis {Plutonium-238, Plutonium-239/240}; AB List Radionuclide Analysis {Plutonium-241}; AB List Radionuclide Analysis {Uranium-233/234, Uranium-

*Trans-ship Ashed material to Lionville - Contact J. Kessner

Matrix *

S Soil
SF Sediment
SO Solid
SL Sludge
W Water
O Oil
A Air
DS Drum Solids
DL Drum Liquids
T Tissue
WI Wipe
L Liquid
V Vegetation
X Other

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

REVIEWED BY JRE DATE 7-14-10

WCH-EE-011

EBERLINE SERVICES

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: W.C. HANFORD City MCHLAND State WA

Date/Time received 07/15/10 0930 CoC No. RC 055-045

Container I.D. No. GWSC-13 Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [X] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [X] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [X] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [X] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry [X]
6. Number of samples in shipping container: 1 Sample Matrix X SOLID
7. Number of containers per sample: 2 (Or see CoC _____)
8. Samples are in correct container Yes [X] No [ ]
9. Paperwork agrees with samples? Yes [X] No [ ]
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [X]
11. Samples are: In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [ ] pH N/A Preservative _____
13. Describe any anomalies:

14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
15. Inspected by [signature] Date: 07/15/10 Time: 1150

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
11B9T1	<60						

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 100482 Calibration date 05 AUG 09

November 8, 2010

Joan Kessner
WCH
2620 Fermi Avenue
Richland, WA 99354

Subject: Analytical Data Package

Dear Ms. Kessner:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	1009108
SDG #	K2133
SAF #	RC-055
Date Received	9/21/10
Matrix	Water
SVOA	
Metals	X
Inorganics	
Pesticides	
VOA	
PCB	
PAH	
DRO	

The electronic data deliverable (EDD) will be e-mailed shortly. If you have any questions, please don't hesitate to contact us at (610) 280-3012.

Sincerely,

Orlette S. Johnson
Lionville Laboratory Incorporated

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-055	
2620 Fermi Avenue	Project Number: K2133	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/27/2010 10:40

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1B9T1	1009108-01	Water	09/13/2010 14:10	09/21/2010 11:15

LIONVILLE LABORATORY
A division of Eberline Analytical Corporation

264 Welsh Pool Road
Exton, Pennsylvania 19341
Phone (610) 280-3000
Fax (610) 280-3041

Case Narrative

Client: WC-HANFORD RC-055
LVL#: 1009108
SDG/SAF#: K2133/RC-055

W.O.#: 60049-001-001-0001-00
Date Received: 09-21-10

METALS

The following is a summary of the QC results accompanying the sample results. Lionville Laboratory (LvL) certifies that all test results meet the requirements of NELAC except as noted below.

1. This narrative covers the analysis of 1 water sample.

2. The sample was prepared and analyzed in accordance with methods listed on the data report forms.

   The sample was prepared with a 2-fold dilution for ICP metals due to limited sample volume. The sample was run and reported with a 100-fold dilution for Aluminum, Boron, Barium, Calcium, Sodium, Strontium, Titanium, and Zinc due to sample matrix. The remaining analytes were run and reported with 12-fold dilutions due to sample matrix.

   The sample was prepared with a 5-fold dilution for Mercury analysis due to limited sample volume.

3. All analyses were performed within the required holding times.

4. Please refer to the Sample Receipt Check List for any sample discrepancies in LvLI's sample acceptance policy.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury) with the exception of CCV3 for Boron. All sample results contained in this report were surrounded by QC within control.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ).

7. All preparation/method blanks (MB) were within method criteria (reported data) {less than the Limit of Quantitation (3-10X the LOD), or samples greater than 20X MB value}.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 16 pages.

10. The matrix spike (MS) recoveries for 13 analytes were outside the 75-125% control limits.

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration level for the following analytes:

Sample ID	Element	PDS Concentration (ppb)	PDS % Recovery
J1B9T1	Aluminum	2,000	99.7
	Barium	2,100	91.4
	Boron	2,100	105.7
	Cadmium	100	116.5
	Calcium	12,000	93.0
	Chromium	100	101.6
	Iron	10,000	104.9
	Silicon	1,100	109.5
	Strontium	100	99.7
	Silver	100	98.3
	Sodium	12,000	99.8
	Titanium	100	107.4
	Zinc	2,100	91.5

11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limit critieria. The ± 20% RPD control limit applies to sample results greater than ten times the MDL. The sample results for Cadmium and Thorium were less than ten times the MDL.

12. For the purposes of this report, the data have been reported to the Limit of Detection (LOD). Values between the LOD and the Limit of Quantitation (LOQ) are acquired in a region of less-certain quantification.

13. LvL is NELAP accredited by the State of Pennsylvania. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.

14. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory

10/27/10
Date

alm/m09-108

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-055	
2620 Fermi Avenue	Project Number: K2133	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/27/2010 10:40

Notes and Definitions

U	Analyte included in the analysis, but not detected
J	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag).
B	Detected but below the Reporting Limit; therefore, result is an estimated concentration (CLP J-Flag)
*	Value outside QC acceptance criteria
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
wet	Sample results reported on a wet weight basis
RPD	Relative Percent Difference

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-055 Project Number: K2133 Project Manager: Joan Kessner	**Reported:** 10/27/2010 10:40

J1B9T1

1009108-01 (Water)

Analyte	Result and Qualifier		Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
			Lionville Laboratory						
Metals by SW846 6000/7000 series									
Aluminum	**1690000**		10000	ug/L	100	L010259	10/19/2010	10/25/2010	6010B
Antimony	144	U	144	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Arsenic	**128**	B	240	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Barium	**2020000**		1000	ug/L	100	L010259	10/19/2010	10/25/2010	6010B
Beryllium	**18.1**	B	48.0	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Bismuth	2400	U	2400	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Boron	**1710000**		4000	ug/L	100	L010259	10/19/2010	10/25/2010	6010B
Cadmium	**112**		48.0	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Calcium	**2300000**		200000	ug/L	100	L010259	10/19/2010	10/25/2010	6010B
Chromium	**1540**		48.0	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Cobalt	**79.5**	B	480	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Copper	**524**		240	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Iron	**78700**		1200	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Lead	**577**		120	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Lithium	**292**	B	600	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Magnesium	**82600**		18000	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Manganese	**1640**		120	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Molybdenum	**216**	B	480	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Nickel	**339**	B	960	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Phosphorus	**5120**		1200	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Potassium	**348000**		96000	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Selenium	240	U	240	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Silicon	**10500**		480	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Strontium	**88000**		2000	ug/L	100	L010259	10/19/2010	10/25/2010	6010B
Silver	48.0	U	48.0	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Thallium	120	U	120	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Sodium	**4690000**		100000	ug/L	100	L010259	10/19/2010	10/25/2010	6010B
Tin	**83.4**	B	2400	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Titanium	**51300**		1000	ug/L	100	L010259	10/19/2010	10/25/2010	6010B
Uranium	4800	U	4800	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Vanadium	**742**		600	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Zinc	**1890000**		2000	ug/L	100	L010259	10/19/2010	10/25/2010	6010B
Zirconium	**15500**		240	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Thorium	**160**	B	600	ug/L	12	L010259	10/19/2010	10/25/2010	6010B
Mercury	0.985	U	0.985	ug/L	1	L009413	09/29/2010	09/30/2010	7470A

264 Welsh Pool Road
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WC-Hanford, Inc.	Project: RC-055	
2620 Fermi Avenue	Project Number: K2133	**Reported:**
Richland WA, 99354	Project Manager: Joan Kessner	10/27/2010 10:40

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L009413 - SW 7470A Prep										
Blank (L009413-BLK1)				Prepared: 09/29/2010 Analyzed: 09/30/2010						
Mercury	0.200	U	0.200	ug/L						
LCS (L009413-BS1)				Prepared: 09/29/2010 Analyzed: 09/30/2010						
Mercury	5.01		0.200	ug/L	5.0606		99.0	80-120		
Duplicate (L009413-DUP3)		**Source: 1009108-01**		Prepared: 09/29/2010 Analyzed: 09/30/2010						
Mercury	0.985	U	0.985	ug/L		0.985 U				20
Matrix Spike (L009413-MS3)		**Source: 1009108-01**		Prepared: 09/29/2010 Analyzed: 09/30/2010						
Mercury	5.07		0.985	ug/L	4.9851	0.985 U	102	75-125		
Batch L010259 - SW 3005A										
Blank (L010259-BLK1)				Prepared: 10/19/2010 Analyzed: 10/25/2010						
Aluminum	50.0	U	50.0	ug/L						
Antimony	6.00	U	6.00	ug/L						
Arsenic	10.0	U	10.0	ug/L						
Barium	5.00	U	5.00	ug/L						
Beryllium	2.00	U	2.00	ug/L						
Bismuth	100	U	100	ug/L						
Boron	20.0	U	20.0	ug/L						
Cadmium	2.00	U	2.00	ug/L						
Calcium	1000	U	1000	ug/L						
Chromium	2.00	U	2.00	ug/L						
Cobalt	20.0	U	20.0	ug/L						
Copper	10.0	U	10.0	ug/L						
Iron	50.0	U	50.0	ug/L						
Lead	5.00	U	5.00	ug/L						
Lithium	25.0	U	25.0	ug/L						
Magnesium	7.13	B	750	ug/L						
Manganese	5.00	U	5.00	ug/L						
Molybdenum	20.0	U	20.0	ug/L						
Nickel	40.0	U	40.0	ug/L						
Phosphorus	50.0	U	50.0	ug/L						
Potassium	4000	U	4000	ug/L						
Selenium	10.0	U	10.0	ug/L						
Silicon	20.0	U	20.0	ug/L						
Strontium	10.0	U	10.0	ug/L						
Silver	2.00	U	2.00	ug/L						

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WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-055 Project Number: K2133 Project Manager: Joan Kessner	**Reported:** 10/27/2010 10:40

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L010259 - SW 3005A										
Blank (L010259-BLK1)				Prepared: 10/19/2010 Analyzed: 10/25/2010						
Thallium	5.00	U	5.00	ug/L						
Sodium	500	U	500	ug/L						
Tin	100	U	100	ug/L						
Titanium	5.00	U	5.00	ug/L						
Uranium	200	U	200	ug/L						
Vanadium	25.0	U	25.0	ug/L						
Zinc	10.0	U	10.0	ug/L						
Zirconium	10.0	U	10.0	ug/L						
Thorium	25.0	U	25.0	ug/L						
LCS (L010259-BS1)				Prepared: 10/19/2010 Analyzed: 10/25/2010						
Aluminum	4900		50.0	ug/L	5000.0		98	80-120		
Antimony	3320		6.00	ug/L	3000.0		111	80-120		
Arsenic	10400		10.0	ug/L	10000		104	80-120		
Barium	5040		5.00	ug/L	5000.0		101	80-120		
Beryllium	252		2.00	ug/L	250.00		101	80-120		
Bismuth	5350		100	ug/L	5000.0		107	80-120		
Boron	5360		20.0	ug/L	5000.0		107	80-120		
Cadmium	266		2.00	ug/L	250.00		107	80-120		
Calcium	25300		1000	ug/L	25000		101	80-120		
Chromium	501		2.00	ug/L	500.00		100	80-120		
Cobalt	2650		20.0	ug/L	2500.0		106	80-120		
Copper	1310		10.0	ug/L	1250.0		105	80-120		
Iron	5080		50.0	ug/L	5000.0		102	80-120		
Lead	2580		5.00	ug/L	2500.0		103	80-120		
Lithium	4960		25.0	ug/L	5000.0		99	80-120		
Magnesium	25400		750	ug/L	25000		102	80-120		
Manganese	768		5.00	ug/L	750.00		102	80-120		
Molybdenum	5250		20.0	ug/L	5000.0		105	80-120		
Nickel	2060		40.0	ug/L	2000.0		103	80-120		
Phosphorus	5380		50.0	ug/L	5000.0		108	80-120		
Potassium	24900		4000	ug/L	25000		100	80-120		
Selenium	10700		10.0	ug/L	10000		107	80-120		
Silicon	4910		20.0	ug/L	5000.0		98	80-120		
Strontium	5080		10.0	ug/L	5000.0		102	80-120		
Silver	505		2.00	ug/L	500.00		101	80-120		
Thallium	10400		5.00	ug/L	10000		104	80-120		

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WC-Hanford, Inc.	Project: RC-055	
2620 Fermi Avenue	Project Number: K2133	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/27/2010 10:40

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L010259 - SW 3005A										
LCS (L010259-BS1)				Prepared: 10/19/2010 Analyzed: 10/25/2010						
Sodium	25000		500	ug/L	25000		100	80-120		
Tin	5280		100	ug/L	5000.0		106	80-120		
Titanium	5310		5.00	ug/L	5000.0		106	80-120		
Uranium	5070		200	ug/L	5000.0		101	80-120		
Vanadium	2540		25.0	ug/L	2500.0		101	80-120		
Zinc	1010		20.0	ug/L	1000.0		101	80-120		
Zirconium	5170		10.0	ug/L	5000.0		103	80-120		
Thorium	5070		25.0	ug/L	5000.0		101	80-120		
Duplicate (L010259-DUP1)		**Source: 1009108-01**		Prepared: 10/19/2010 Analyzed: 10/25/2010						
Aluminum	1530000		10000	ug/L		1690000			10	20
Antimony	144	U	144	ug/L		144 U				20
Arsenic	134	B	240	ug/L		128			5	20
Barium	843000		1000	ug/L		2020000			82*	20
Beryllium	16.6	B	48.0	ug/L		18.1			9	20
Bismuth	121	B	2400	ug/L		2400 U				20
Boron	1790000		4000	ug/L		1710000			4	20
Cadmium	64.2		48.0	ug/L		112			54*	20
Calcium	2090000		200000	ug/L		2300000			10	20
Chromium	1410		48.0	ug/L		1540			9	20
Cobalt	81.3	B	480	ug/L		79.5			2	20
Copper	514		240	ug/L		524			2	20
Iron	72500		1200	ug/L		78700			8	20
Lead	528		120	ug/L		577			9	20
Lithium	281	B	600	ug/L		292			4	20
Magnesium	77200		18000	ug/L		82600			7	20
Manganese	1540		120	ug/L		1640			6	20
Molybdenum	205	B	480	ug/L		216			5	20
Nickel	317	B	960	ug/L		339			7	20
Phosphorus	4980		1200	ug/L		5120			3	20
Potassium	344000		96000	ug/L		348000			1	20
Selenium	240	U	240	ug/L		240 U				20
Silicon	10400		480	ug/L		10500			0.6	20
Strontium	59800		2000	ug/L		88000			38*	20
Silver	48.0	U	48.0	ug/L		48.0 U				20
Thallium	120	U	120	ug/L		120 U				20
Sodium	4420000		100000	ug/L		4690000			6	20

264 Welsh Pool Road
Exton, PA 19341
Phone: 610-280-3000
Fax: 610-280-3041

WC-Hanford, Inc.	Project: RC-055	
2620 Fermi Avenue	Project Number: K2133	Reported:
Richland WA, 99354	Project Manager: Joan Kessner	10/27/2010 10:40

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers		Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L010259 - SW 3005A										
Duplicate (L010259-DUP1)		**Source: 1009108-01**		Prepared: 10/19/2010 Analyzed: 10/25/2010						
Tin	79.4	B	2400	ug/L		83.4			5	20
Titanium	49400		1000	ug/L		51300			4	20
Uranium	4800	U	4800	ug/L		4800 U				20
Vanadium	700		600	ug/L		742			6	20
Zinc	1700000		2000	ug/L		1890000			10	20
Zirconium	14700		240	ug/L		15500			5	20
Thorium	127	B	600	ug/L		160			23*	20
Matrix Spike (L010259-MS1)		**Source: 1009108-01**		Prepared: 10/19/2010 Analyzed: 10/25/2010						
Aluminum	1570000		10000	ug/L	4000.0	1690000	-3030*	75-125		
Antimony	1100		144	ug/L	1000.0	144 U	110	75-125		
Arsenic	4110		240	ug/L	4000.0	128	100	75-125		
Barium	1010000		1000	ug/L	4000.0	2020000	25100*	75-125		
Beryllium	108		48.0	ug/L	100.00	18.1	90	75-125		
Bismuth	10200		2400	ug/L	10000	2400 U	102	75-125		
Boron	1800000		4000	ug/L	2000.0	1710000	4530*	75-125		
Cadmium	167		48.0	ug/L	100.00	112	55*	75-125		
Calcium	2200000		200000	ug/L	50000	2300000	-208*	75-125		
Chromium	1780		48.0	ug/L	400.00	1540	60*	75-125		
Cobalt	1030		480	ug/L	1000.0	79.5	96	75-125		
Copper	939		240	ug/L	500.00	524	83	75-125		
Iron	74500		1200	ug/L	2000.0	78700	-210*	75-125		
Lead	1440		120	ug/L	1000.0	577	86	75-125		
Lithium	2180		600	ug/L	2000.0	292	94	75-125		
Magnesium	124000		18000	ug/L	50000	82600	83	75-125		
Manganese	2470		120	ug/L	1000.0	1640	83	75-125		
Molybdenum	2140		480	ug/L	2000.0	216	96	75-125		
Nickel	1240		960	ug/L	1000.0	339	90	75-125		
Phosphorus	15200		1200	ug/L	10000	5120	100	75-125		
Potassium	402000		96000	ug/L	50000	348000	108	75-125		
Selenium	3900		240	ug/L	4000.0	240 U	98	75-125		
Silicon	13200		480	ug/L	2000.0	10500	138*	75-125		
Strontium	65800		2000	ug/L	2000.0	88000	-1110*	75-125		
Silver	49.9		48.0	ug/L	100.00	48.0 U	50*	75-125		
Thallium	3750		120	ug/L	4000.0	120 U	94	75-125		
Sodium	4570000		100000	ug/L	50000	4690000	-244*	75-125		
Tin	2000	B	2400	ug/L	2000.0	83.4	96	75-125		

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Richland WA, 99354	Project Manager: Joan Kessner	10/27/2010 10:40

Metals by SW846 6000/7000 series - Quality Control

Lionville Laboratory

Analyte	Result and Qualifiers	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
Batch L010259 - SW 3005A									
Matrix Spike (L010259-MS1)		**Source: 1009108-01**	Prepared: 10/19/2010 Analyzed: 10/25/2010						
Titanium	52000	1000	ug/L	2000.0	51300	35*	75-125		
Uranium	9390	4800	ug/L	10000	4800 U	94	75-125		
Vanadium	1620	600	ug/L	1000.0	742	88	75-125		
Zinc	1750000	2000	ug/L	1000.0	189000	13500*	75-125		
Zirconium	24300	240	ug/L	10000	15500	88	75-125		
Thorium	9260	600	ug/L	10000	160	91	75-125		

Lionville Laboratory **Logbook #:** 829

SAMPLE DIGESTION RECORD

Digestion Batch #: L010259
Date/Time Initiated: 10/19/10 1205
Date/Time Completed: 10/20/10 1730
Analyst: JJS
Matrix (circle): Soil Water Other
Method (circle one): 3005A 3010A 3050 200.7 (1994)

Digested / Undigested (circle one)
Balance #: N/A
Balance Cal Verification: Y NA
Temp: 98
BLOCK 1 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures

C/C-clear/colorless

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/ TC	Texture	Color / Appearance	Artifact	Turb
1009108-01		25	50	<2	TO	N/A	C/C	N/A	N/A
L010254 Rg1		25	50	<2			C/C		
* -MS1	0.5	25	50	<2			C/C		
-MS1		50	50				C/C		
* -MS1	0.5	50	50				C/C		

JJS
10/20/10

Spiking IDs / Expiration Date:
MS#: 8100-09-07
-08
-09
6072-087-14
LCS#: 086-16
-08
-07
-09

Reagent IDs:
HNO_3 J19073
HCl J18091
H_2O_2
1:1 HNO_3
1:1 HCl

File ID#:

Data Review By / Date: 10/21/10

R:\group\QA\SOP\
Signed\SPI\Metals Digestion log.doc

* 6072-087-09 250ml
-10
-11
-12
085-07

Page #:

000000011

PREPARATION BENCH SHEET

L010259

Lionville Laboratory

Printed: 10/27/2010 10:02:36AM

Matrix: Water **Prepared using: METALS - SW 3005A** **(No Surrogate)**

Lab Number	Analysis	Prepared	Initial (mL)	Final (mL)	Spike ID	Source ID	ul Spike	ul Surrogate	Client	Extraction Comments
1009108-01	6010B ICP Trace	10/19/2010 10:29	25	50					WC-Hanford, Inc.	HSL + B, Bi, Mo, Li, P, Si, Sn, Sr, Th, U, Zr
L010259-BLK1	QC	10/19/2010 10:29	50	50						
L010259-BS1	QC	10/19/2010 10:29	50	50	1001197		500			
L010259-DUP1	QC	10/19/2010 10:29	25	50		1009108-01				
L010259-MS1	QC	10/19/2010 10:29	25	50	1001747	1009108-01	500			

99999912

Extracts Relinquished By 10/20/10 Date

Extracts Received By 10/20/10 Date

Lionville Laboratory

MERCURY PREPARATION

Analyst: [illegible]
Date 9/29/10
Start Time/Temp: 2000/95°
End Time/Temp:

Instrument ID: Hg3A
Balance # NA
Pipette Calibration (Daily) (✓)

Logbook # 824
Prep Batch: L009413
Worksheet: Hg 093001
SOP No. ME-HgCVAA
BLOCK 1 (2) (circle one)

NOTE: All temperatures are recorded as corrected temperatures.

LvL Work Order#	pH < 2 (Liq)	Spike Vol (mL)	Spike Conc. (µg/L)	Initial Wt. or Vol. (g or mL)	Final Sample Vol (mL)	Comments, % Solids, etc.
blank				33	33	
0.2 µg/L		0.0667		33	33	
1.0 µg/L		0.333		33	33	
2.0 µg/L		0.667		33	33	
5.0 µg/L		1.667		33	33	
10.0 µg/L		3.333		33	33	
IEV		0.0835	2.5	33	33	
CCV		0.167	5.0	33	33	
ICB/CCB				33	33	
L009413-BLK1				33	33	
BS1		0.167	5.0	33	33	
1009046-01	<			33	33	
L009413-DUP1	<			33	33	
MS1	<	0.333	1.0	33	33	
1009067-02	<			33	33	
L009413-DUP2	<			33	33	
MS2	<			33	33	
1009067-03	<			33	33	
1009108-01	<			6.7	33	Prepared at 5x due to limited volume MW 9/29/10
L009413-DUP3	<			6.7	33	
MS3	<			6.7	33	
1009128-08	<			33	33	
12	<			33	33	
1009129-05	<			33	33	
	MW 9/29/10					

Standard:	ID	Prep Date/Time
ICAL/MS	RI 09019853	9/29/10 1670
ICV/CCV/LCS	I.V. 0902297A	1

Reviewed By/Date: [illegible] 10/1/10

se book # 9368 for std traceability information

Soil LCS True Value = N/A mg/Kg
Standard #

Water Matrix Spiking Solution Concentration = 0.1 µg/ml
Soil LCS Spiking Concentration: 1.0 µg/ml

Lionville Laboratory Use Only

1009408

Custody Transfer Record/Lab Work Request

Page 1 of 1

SRC

SRC

LVLI LIONVILLE LABORATORY INC.

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

A-E

Client: Ebasco/WC Hanford SDG# K2133 RC-055

Est. Final Proj. Sampling Date:

Project#:

Project Contact/Phone#:

Lionville Laboratory Project Manager: O Johnson

QC: SW Del: STD TAT: 30

Date Rec'd: 9-21-10 Date Due: 10-21-10

Refrigerator #									1							
#/Type Container	Liquid								1P							
	Solid															
Volume									25							
Preservatives									—							
ANALYSES REQUESTED →		ORGANIC							INORG							
		VOA	BNA	Pest/PCB	Herb				Metal	CN						
		Lionville Laboratory Use Only														
									Met							

MATRIX CODES:
S- Soil
SE- Sediment
SO- Solid
SL- Sludge
W- Water
O- Oil
A- Air
DS- Drum Solids
DL- Drum Liquids
L- EP/TCLP Leachate
WI- Wipe
X- Other
F- Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected															
01	J1B9T1	✓	✓	W	7/13/10	14:10								X							

Special Instructions:

Y/SL+ B, Bi, Li, Mo, P, Si, Sn, Sr, Th, U, Zr

Special Instructions:

1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
[illegible]	[illegible]	9/21/10	1115

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time
ORIGINAL REWRITTEN			

00000014

PAGE 1 Eberline Srvces CHAIN OF CUSTODY ORD # S0-09-149

09/20/10 09:19:02 WORK ID: SAF# RC-055 SDG# K2133

RCVD: 09/20/10 DUE: 09/20/10 SDG# K2133 KEEP: 09/20/10 DISP: S

GRP# 7039

DASH	SAMPLE IDENTIFICATION	STORED	TESTS
01A-X	J1B9T1	SCA-2	E_BTL

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
[illegible]	9/20/10	LIONVILLE	9/20/10	[illegible]	9-21-10
[illegible]	9-21-10				

000000015

Lionville Laboratory

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: E berline / WRHanford
Project/SAF/SOW/Release #: SDG K2133

Date: 9/21/10

LvL Batch #: 1009 108

Sample Custodian: [illegible]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped?	Carrier [illegible]		Airbill # 7939 8139 2981
2. Custody Seals on coolers or shipping containers intact, signed & dated?	☑ Yes	☐ No	☐ No Seals
3. Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No	*Comments:*
4. All expected paperwork received (coc & other client specific information) sealed in plactic bag and easily accessible?	☑ Yes	☐ No	
5. Samples received cooled or ambient?	Temp 8.9	°C	Cooler # Box
How was the temperature taken?	☑ IR	☐ Temp. Blank	☐ Other (Specify)
Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C)	☑ Yes	☐ No	
6. Custody seals on sample containers intact. signed and dated?	☑ Yes	☐ No	☐ No Seals
7. COC (Client & LvL) signed & dated?	☑ Yes	☐ No	
8. Sample containers are intact?	☑ Yes	☐ No	
9. All samples on COC received?	☑ Yes	☐ No	
All samples received on COC?	☑ Yes	☐ No	
10. All sample label information matches COC?	☑ Yes	☐ No	
11. Samples properly preserved? (If #5 is no. then this is no.)	☑ Yes	☐ No	
12. Samples received within hold times?	☑ Yes	☐ No	
Short holds taken to wet lab?	☐ Yes	☐ No	☑ N/A
13. VOA. TOC. TOX free of headspace?	☐ Yes	☐ No	☑ N/A
14. QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A
15. Shipment meets LvL Sample Acceptance Policy? (Identify all bottles that do not meet the policy. which is on the reverse of this page.)	☑ Yes	☐ No	
16. Project Manager contacted concerning any discrepancies?	☐ Yes	☐ No	☑ N/A
Person Contacted _____		Date _____	