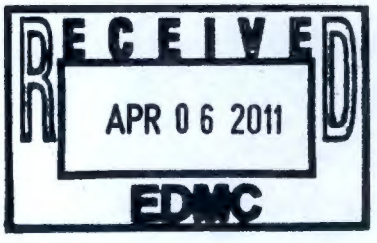
0095249

SAF-RC-196
Soil/Sediment Sampling – Integrated Remedial Investigation/Feasibility Study, 100-H Area Boreholes
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

No Distribution Required



COMMENTS:

SDG K3095 SAF-RC-196

☑ Rad only Chem only Rad & Chem

☑ Complete Partial

Sample Location: C7861 (116-H-7); I-003 EB, I-012

EBERLINE SERVICES

EBERLINE ANALYTICAL CORPORATION
2030 Wright Avenue
Richmond, California 94804-3849
Phone (510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

March 22, 2011

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

Reference: **P.O. #S00W235A00**
Eberline Analytical S1-02-040-7427, SDG K3095

Dear Ms. Kessner:

Enclosed is the data report for two solid (soil) samples designated under SAF No. RC-196. The samples were received at Eberline Analytical on February 3, 2011. The samples were analyzed according to the accompanying chain-of-custody documents.

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 K3095 was composed of two solid (soil) samples designated under SAF No. RC-196 with a Project Designation of: Soil/Sediment Sampling – 100-H Boreholes.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist. The results were transmitted to WCH via e-mail on March 22, 2011.

2.0 ANALYSIS NOTES

2.1 Tritium Analysis, low-level

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, low-level

No problems were encountered during the course of the analyses.

2.6 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.7 Isotopic Plutonium Analysis

No problems were encountered during the course of the analyses.

2.8 Americium-241 Analysis

No problems were encountered during the course of the analyses.

2.90 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 Manager

3/22/11
Date

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K3095

SDG	7427
Contact	N. Joseph Verville

Client	Hanford
Contract	No. S00W235A00
Case no	SDG_K3095

SUMMARY DATA SECTION

TABLE OF CONTENTS

VB

Prepared by

Reviewed by

Lab id	EBRLNE
Protocol	RIFS-100
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

SDG 7427
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K3095

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 RIFS-100
Version Ver 1.0
Form DVD-RG
Version 3.06
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SDG 7427
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K3095

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.

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

LAB SAMPLE SUMMARY

SDG 7427
Contact N. Joseph Verville

Client Hanford
Contract No. S00W235A00
Case no SDG K3095

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S102040-01	B29NB3	C7861(116-H-7);I-003 EB	SOLID		RC-196	RC-196-362	01/31/11 07:10
S102040-02	B29NH6	C7861(116-H-7);I-012	SOLID		RC-196	RC-196-405	01/31/11 14:00
S102040-03	Lab Control Sample		SOLID		RC-196		
S102040-04	Method Blank		SOLID		RC-196		
S102040-05	Duplicate (S102040-01)	C7861(116-H-7);I-003 EB	SOLID		RC-196		01/31/11 07:10

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

QC SUMMARY

SDG 7427
Contact N. Joseph Verville

Client Hanford
Contract No. S00W235A00
Case no SDG K3095

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS RECEIVED	DAYS COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7427	RC-196-362	B29NB3	SOLID	100.0	939 g		02/03/11	3	S102040-01	7427-001
	RC-196-405	B29NH6	SOLID	92.4	1225 g		02/03/11	3	S102040-02	7427-002
		Method Blank	SOLID						S102040-04	7427-004
		Lab Control Sample	SOLID						S102040-03	7427-003
		Duplicate (S102040-01)	SOLID	100.0	939 g		02/03/11	3	S102040-05	7427-005

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

SDG 7427
Contact N. Joseph Verville

PREP BATCH SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K3095

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE	RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy												
AM	SOLID	Americium 241 in Solids	7289-144	8.0	2			1	1	1/1		
PU	SOLID	Plutonium, Isotopic in Solids	7289-144	8.0	2			1	1	1/1		
U	SOLID	Uranium, Isotopic in Solids	7289-144	8.0	2			1	1	1/1		
Beta Counting												
SR	SOLID	Total Strontium in Solids	7289-144	10.4	2			1	1	1/1		
TC	SOLID	Technetium 99 in Solids	7289-144	13.2	2			1	1	1/1		
Gamma Spectroscopy												
GAM	SOLID	Gamma Scan	7289-144	7.0	2			1	1	1/1		
Liquid Scintillation Counting												
C	SOLID	Carbon 14 in Solids	7289-144	10.0	2			1	1	1/1		
H	SOLID	Tritium in Solids	7289-144	10.0	2			1	1	1/1		
NI_L	SOLID	Nickel 63 in Solids	7289-144	11.2	2			1	1	1/1		

Duplicates and Spikes are those with original sample in the QC Batch of some Client sample in this SDG.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

SDG 7427
Contact N. Joseph Verville

LAB WORK SUMMARY

Client Hanford
Contract No. S00W235A00
Case no SDG K3095

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S102040-01	B29NB3			7427-001	AM		03/11/11	03/14/11	BW	Americium 241 in Solids
01/31/11	C7861(116-H-7);I-003 EB		SOLID	7427-001	C		03/17/11	03/18/11	BW	Carbon 14 in Solids
02/03/11	RC-196-362	RC-196		7427-001	GAM		02/25/11	02/28/11	MWT	Gamma Scan
				7427-001	H		03/16/11	03/18/11	BW	Tritium in Solids
				7427-001	NI_L		03/16/11	03/18/11	BW	Nickel 63 in Solids
				7427-001	PU		03/04/11	03/07/11	BW	Plutonium, Isotopic in Solids
				7427-001	SR		03/14/11	03/18/11	BW	Total Strontium in Solids
				7427-001	TC		03/12/11	03/16/11	BW	Technetium 99 in Solids
				7427-001	U		03/11/11	03/11/11	BW	Uranium, Isotopic in Solids
S102040-02	B29NH6			7427-002	AM		03/11/11	03/14/11	BW	Americium 241 in Solids
01/31/11	C7861(116-H-7);I-012		SOLID	7427-002	C		03/17/11	03/18/11	BW	Carbon 14 in Solids
02/03/11	RC-196-405	RC-196		7427-002	GAM		02/25/11	02/28/11	MWT	Gamma Scan
				7427-002	H		03/16/11	03/18/11	BW	Tritium in Solids
				7427-002	NI_L		03/16/11	03/18/11	BW	Nickel 63 in Solids
				7427-002	PU		03/04/11	03/07/11	BW	Plutonium, Isotopic in Solids
				7427-002	SR		03/14/11	03/18/11	BW	Total Strontium in Solids
				7427-002	TC		03/14/11	03/16/11	BW	Technetium 99 in Solids
				7427-002	U		03/11/11	03/11/11	BW	Uranium, Isotopic in Solids
S102040-03	Lab Control Sample			7427-003	AM		03/11/11	03/14/11	BW	Americium 241 in Solids
			SOLID	7427-003	C		03/17/11	03/18/11	BW	Carbon 14 in Solids
		RC-196		7427-003	GAM		02/25/11	02/28/11	MWT	Gamma Scan
				7427-003	H		03/17/11	03/18/11	BW	Tritium in Solids
				7427-003	NI_L		03/16/11	03/18/11	BW	Nickel 63 in Solids
				7427-003	PU		03/04/11	03/07/11	BW	Plutonium, Isotopic in Solids
				7427-003	SR		03/14/11	03/18/11	BW	Total Strontium in Solids
				7427-003	TC		03/12/11	03/16/11	BW	Technetium 99 in Solids
				7427-003	U		03/11/11	03/11/11	BW	Uranium, Isotopic in Solids
S102040-04	Method Blank			7427-004	AM		03/11/11	03/14/11	BW	Americium 241 in Solids
			SOLID	7427-004	C		03/17/11	03/18/11	BW	Carbon 14 in Solids
		RC-196		7427-004	GAM		02/25/11	02/28/11	MWT	Gamma Scan
				7427-004	H		03/16/11	03/18/11	BW	Tritium in Solids
				7427-004	NI_L		03/16/11	03/18/11	BW	Nickel 63 in Solids
				7427-004	PU		03/04/11	03/07/11	BW	Plutonium, Isotopic in Solids
				7427-004	SR		03/14/11	03/18/11	BW	Total Strontium in Solids
				7427-004	TC		03/14/11	03/16/11	BW	Technetium 99 in Solids
				7427-004	U		03/11/11	03/11/11	BW	Uranium, Isotopic in Solids

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

SDG 7427
Contact N. Joseph Verville

WORK SUMMARY, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K3095

LAB SAMPLE / COLLECTED / RECEIVED	CLIENT SAMPLE ID / LOCATION / CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
S102040-05	Duplicate (S102040-01)			7427-005	AM		03/11/11	03/14/11	BW	Americium 241 in Solids
01/31/11	C7861(116-H-7);I-003 EB		SOLID	7427-005	C		03/17/11	03/18/11	BW	Carbon 14 in Solids
02/03/11		RC-196		7427-005	GAM		02/25/11	02/28/11	MWT	Gamma Scan
				7427-005	H		03/16/11	03/18/11	BW	Tritium in Solids
				7427-005	NI_L		03/16/11	03/18/11	BW	Nickel 63 in Solids
				7427-005	PU		03/04/11	03/07/11	BW	Plutonium, Isotopic in Solids
				7427-005	SR		03/14/11	03/18/11	BW	Total Strontium in Solids
				7427-005	TC		03/12/11	03/16/11	BW	Technetium 99 in Solids
				7427-005	U		03/11/11	03/11/11	BW	Uranium, Isotopic in Solids

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	RC-196	Americium 241 in Solids	AMCMISO_IE_PLATE_AEA	2			1	1	1	5
C	RC-196	Carbon 14 in Solids	C14_COX_LSC	2			1	1	1	5
GAM	RC-196	Gamma Scan	GAMMA_GS	2			1	1	1	5
H	RC-196	Tritium in Solids	TRITIUM_COX_LSC	2			1	1	1	5
NI_L	RC-196	Nickel 63 in Solids	NI63_LSC	2			1	1	1	5
PU	RC-196	Plutonium, Isotopic in Solids	PUISO_PLATE_AEA	2			1	1	1	5
SR	RC-196	Total Strontium in Solids	SRTOT_SEP_PRECIP_GPC	2			1	1	1	5
TC	RC-196	Technetium 99 in Solids	TC99_TR_SEP_GPC	2			1	1	1	5
U	RC-196	Uranium, Isotopic in Solids	UISO_PLATE_AEA	2			1	1	1	5
TOTALS				18			9	9	9	45

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LWS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

7427-004 **Method Blank**

METHOD BLANK

SDG	7427	Client/Case no	Hanford SDG K3095
Contact	N. Joseph Verville	Contract	No. S00W235A00
Lab sample id	S102040-04	Client sample id	Method Blank
Dept sample id	7427-004	Material/Matrix	SOLID
		SAF No	RC-196

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.967	1.7	2.91	10.0	U	H
Carbon 14	14762-75-5	-0.592	1.3	2.28	50.0	U	C
Nickel 63	13981-37-8	0.727	1.8	3.03	30.0	U	NI_L
Total Strontium	SR-RAD	-0.019	0.13	0.262	1.00	U	SR
Technetium 99	14133-76-7	-0.023	0.040	0.092	0.250	U	TC
Plutonium 238	13981-16-3	0	0.076	0.291	1.00	U	PU
Plutonium 239/240	PU-239/240	-0.038	0.076	0.291	1.00	U	PU
Uranium 233/234	U-233/234	0	0.070	0.268	1.00	U	U
Uranium 235	15117-96-1	0	0.085	0.324	1.00	U	U
Uranium-238	U-238	0	0.070	0.268	1.00	U	U
Americium 241	14596-10-2	0.244	0.37	0.585	1.00	U	AM
Beryllium 7	13966-02-4	U		0.063	0.300	U	GAM
Cesium 134	13967-70-9	U		0.011		U	GAM
Cesium 137	10045-97-3	U		0.008	0.100	U	GAM
Cobalt 60	10198-40-0	U		0.009	0.050	U	GAM
Europium 152	14683-23-9	U		0.025	0.100	U	GAM
Europium 154	15585-10-1	U		0.028	0.100	U	GAM
Europium 155	14391-16-3	U		0.030	0.100	U	GAM
Potassium 40	13966-00-2	U		0.107		U	GAM
Radium 226	13982-63-3	U		0.027	0.100	U	GAM
Antimony 125	14234-35-6	U		0.021		U	GAM
Ruthenium 106	13967-48-1	U		0.067		U	GAM
Americium 241	14596-10-2	U		0.051	0.300	U	GAM
Barium 133	13981-41-4	U		0.011		U	GAM
Radium 228	15262-20-1	U		0.042	0.200	U	GAM
Silver 108m	14391-65-2	U		0.007		U	GAM

Lab id	EBRLNE
Protocol	RIFS-100
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/19/11

7427-004 Method Blank

BLANK, cont.

SDG	7427	Client/Case no	Hanford SDG K3095
Contact	N. Joseph Verville	Contract	No. S00W235A00
Lab sample id	S102040-04	Client sample id	Method Blank
Dept sample id	7427-004	Material/Matrix	SOLID
		SAF No	RC-196

QC-BLANK #77368

Lab id	EBRLNE
Protocol	RIFS-100
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

7427-003 Lab Control Sample

LAB CONTROL SAMPLE

SDG 7427 Client/Case no Hanford SDG K3095

Contact N. Joseph Verville Contract No. S00W235A00

Lab sample id S102040-03 Client sample id Lab Control Sample

Dept sample id 7427-003 Material/Matrix SOLID

SAF No RC-196

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	133	5.5	3.19	10.0		H	140	5.6	95	83-117	80-120
Carbon 14	1090	22	5.10	50.0		C	1060	42	103	83-117	80-120
Nickel 63	199	5.8	2.89	30.0		NI_L	216	8.6	92	83-117	80-120
Total Strontium	9.09	0.58	0.270	1.00		SR	8.72	0.35	104	80-120	80-120
Technetium 99	9.19	0.45	0.104	0.250		TC	9.10	0.36	101	78-122	80-120
Plutonium 238	12.4	1.7	0.284	1.00		PU	11.5	0.46	108	74-126	80-120
Plutonium 239/240	12.6	1.7	0.284	1.00		PU	13.2	0.53	95	77-123	80-120
Uranium 233/234	9.70	1.3	0.736	1.00		U	9.28	0.37	104	75-125	80-120
Uranium 235	8.42	1.2	0.240	1.00		U	7.54	0.30	112	72-128	80-120
Uranium-238	10.9	1.4	0.702	1.00		U	10.1	0.40	108	75-125	80-120
Americium 241	12.1	2.0	0.510	1.00		AM	10.1	0.40	120	66-134	80-120
Cesium 137	0.328	0.027	0.018	0.100		GAM	0.324	0.013	101	83-117	80-120
Cobalt 60	0.345	0.030	0.017	0.050		GAM	0.371	0.015	93	83-117	80-120

QC-LCS #77367

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

7427-005 B29NB3

DUPLICATE

SDG 7427 Client/Case no Hanford SDG K3095

Contact N. Joseph Verville Contract No. S00W235A00

DUPLICATE	ORIGINAL	
Lab sample id S102040-05	Lab sample id S102040-01	Client sample id B29NB3
Dept sample id 7427-005	Dept sample id 7427-001	Location/Matrix C7861(116-H-7);I-003 EB SOLID
	Received 02/03/11	Collected/Weight 01/31/11 07:10 939 g
% solids 100.0	% solids 100.0	Custody/SAF No RC-196-362 RC-196

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	DER σ
Tritium	0.443	1.7	2.82	10.0	U	H	0.784	1.7	2.80	U	-		0.3
Carbon 14	-0.259	1.3	2.15	50.0	U	C	-0.088	1.3	2.20	U	-		0.2
Nickel 63	0.351	1.7	2.92	30.0	U	NI_L	-0.388	1.7	2.92	U	-		0.6
Total Strontium	-0.013	0.13	0.265	1.00	U	SR	0.085	0.14	0.268	U	-		1.0
Technetium 99	-0.029	0.045	0.097	0.250	U	TC	-0.030	0.037	0.090	U	-		0
Plutonium 238	-0.066	0.066	0.316	1.00	U	PU	0.036	0.15	0.348	U	-		1.2
Plutonium 239/240	0.066	0.066	0.253	1.00	U	PU	0.036	0.073	0.278	U	-		0.6
Uranium 233/234	0.187	0.13	0.238	1.00	U	U	0.252	0.19	0.241		30	158	0.6
Uranium 235	0	0.075	0.289	1.00	U	U	0.038	0.076	0.292	U	-		0.7
Uranium-238	0.156	0.13	0.238	1.00	U	U	0.126	0.13	0.241	U	-		0.3
Americium 241	0	0.15	0.424	1.00	U	AM	0.154	0.31	0.567	U	-		0.9
Beryllium 7	U		0.145	0.300	U	GAM	U		0.132	U	-		0.1
Cesium 134	U		0.020		U	GAM	U		0.019	U	-		0.1
Cesium 137	U		0.014	0.100	U	GAM	U		0.013	U	-		0.1
Cobalt 60	U		0.014	0.050	U	GAM	U		0.012	U	-		0.2
Europium 152	U		0.036	0.100	U	GAM	U		0.039	U	-		0.1
Europium 154	U		0.042	0.100	U	GAM	U		0.036	U	-		0.2
Europium 155	U		0.053	0.100	U	GAM	U		0.048	U	-		0.1
Potassium 40	1.31	0.20	0.130			GAM	1.21	0.26	0.105		8	42	0.6
Radium 226	0.178	0.031	0.027	0.100		GAM	0.167	0.028	0.026		6	39	0.5
Antimony 125	U		0.035		U	GAM	U		0.034	U	-		0
Ruthenium 106	U		0.108		U	GAM	U		0.114	U	-		0.1
Americium 241	U		0.108	0.300	U	GAM	U		0.067	U	-		0.6
Barium 133	U		0.019		U	GAM	U		0.018	U	-		0.1
Radium 228	0.283	0.057	0.043	0.200		GAM	0.262	0.052	0.047		8	45	0.5
Silver 108m	U		0.011		U	GAM	U		0.010	U	-		0.1

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

7427-005 B29NB3

DUPLICATE, cont.

SDG	7427			Client/Case no	Hanford SDG K3095
Contact	N. Joseph Verville			Contract	No. S00W235A00
	DUPLICATE		ORIGINAL		
Lab sample id	S102040-05	Lab sample id	S102040-01	Client sample id	B29NB3
Dept sample id	7427-005	Dept sample id	7427-001	Location/Matrix	C7861(116-H-7);I-003 EB SOLID
		Received	02/03/11	Collected/Weight	01/31/11 07:10 939 g
% solids	100.0	% solids	100.0	Custody/SAF No	RC-196-362 RC-196

QC-DUP#1 #77369

Soil/Sediment Sampling - 100-H Boreholes

Lab id	EBRLNE
Protocol	RIFS-100
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

7427-001 B29NB3

DATA SHEET

SDG	7427	Client/Case no	Hanford SDG K3095
Contact	N. Joseph Verville	Contract	No. S00W235A00
Lab sample id	S102040-01	Client sample id	B29NB3
Dept sample id	7427-001	Location/Matrix	C7861(116-H-7);I-003 EB SOLID
Received	02/03/11	Collected/Weight	01/31/11 07:10 939 g
% solids	100.0	Custody/SAF No	RC-196-362 RC-196

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.784	1.7	2.80	10.0	U	H
Carbon 14	14762-75-5	-0.088	1.3	2.20	50.0	U	C
Nickel 63	13981-37-8	-0.388	1.7	2.92	30.0	U	NI_L
Total Strontium	SR-RAD	0.085	0.14	0.268	1.00	U	SR
Technetium 99	14133-76-7	-0.030	0.037	0.090	0.250	U	TC
Plutonium 238	13981-16-3	0.036	0.15	0.348	1.00	U	PU
Plutonium 239/240	PU-239/240	0.036	0.073	0.278	1.00	U	PU
Uranium 233/234	U-233/234	0.252	0.19	0.241	1.00		U
Uranium 235	15117-96-1	0.038	0.076	0.292	1.00	U	U
Uranium-238	U-238	0.126	0.13	0.241	1.00	U	U
Americium 241	14596-10-2	0.154	0.31	0.567	1.00	U	AM
Beryllium 7	13966-02-4	U		0.132	0.300	U	GAM
Cesium 134	13967-70-9	U		0.019		U	GAM
Cesium 137	10045-97-3	U		0.013	0.100	U	GAM
Cobalt 60	10198-40-0	U		0.012	0.050	U	GAM
Europium 152	14683-23-9	U		0.039	0.100	U	GAM
Europium 154	15585-10-1	U		0.036	0.100	U	GAM
Europium 155	14391-16-3	U		0.048	0.100	U	GAM
Potassium 40	13966-00-2	1.21	0.26	0.105			GAM
Radium 226	13982-63-3	0.167	0.028	0.026	0.100		GAM
Antimony 125	14234-35-6	U		0.034		U	GAM
Ruthenium 106	13967-48-1	U		0.114		U	GAM
Americium 241	14596-10-2	U		0.067	0.300	U	GAM
Barium 133	13981-41-4	U		0.018		U	GAM
Radium 228	15262-20-1	0.262	0.052	0.047	0.200		GAM
Silver 108m	14391-65-2	U		0.010		U	GAM

Lab id	EBRLNE
Protocol	RIFS-100
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/19/11

DATA SHEET, cont

SDG	7427	Client/Case no	Hanford SDG K3095
Contact	N. Joseph Verville	Contract	No. S00W235A00
Lab sample id	S102040-01	Client sample id	B29NB3
Dept sample id	7427-001	Location/Matrix	C7861(116-H-7);I-003 EB SOLID
Received	02/03/11	Collected/Weight	01/31/11 07:10 939 g
% solids	100.0	Custody/SAF No	RC-196-362 RC-196

Soil/Sediment Sampling - 100-H Boreholes

Lab id	EBRLNE
Protocol	RIFS-100
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/19/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3095

7427-002 B29NH6

DATA SHEET

SDG	7427	Client/Case no	Hanford	SDG K3095	
Contact	N. Joseph Verville	Contract	No. S00W235A00		
Lab sample id	S102040-02	Client sample id	B29NH6		
Dept sample id	7427-002	Location/Matrix	C7861(116-H-7);I-012	SOLID	
Received	02/03/11	Collected/Weight	01/31/11 14:00	1225 g	
% solids	92.4	Custody/SAF No	RC-196-405	RC-196	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.502	1.7	2.87	10.0	U	H
Carbon 14	14762-75-5	0.985	1.3	2.14	50.0	U	C
Nickel 63	13981-37-8	-0.492	1.8	3.08	30.0	U	NI_L
Total Strontium	SR-RAD	0.616	0.21	0.290	1.00		SR
Technetium 99	14133-76-7	-0.026	0.038	0.091	0.250	U	TC
Plutonium 238	13981-16-3	0.179	0.18	0.342	1.00	U	PU
Plutonium 239/240	PU-239/240	0.089	0.090	0.341	1.00	U	PU
Uranium 233/234	U-233/234	0.482	0.24	0.231	1.00		U
Uranium 235	15117-96-1	0	0.073	0.279	1.00	U	U
Uranium-238	U-238	0.512	0.25	0.231	1.00		U
Americium 241	14596-10-2	0.214	0.26	0.410	1.00	U	AM
Beryllium 7	13966-02-4	U		0.231	0.300	U	GAM
Cesium 134	13967-70-9	U		0.035		U	GAM
Cesium 137	10045-97-3	0.055	0.027	0.028	0.100		GAM
Cobalt 60	10198-40-0	U		0.027	0.050	U	GAM
Europium 152	14683-23-9	U		0.060	0.100	U	GAM
Europium 154	15585-10-1	U		0.091	0.100	U	GAM
Europium 155	14391-16-3	U		0.081	0.100	U	GAM
Potassium 40	13966-00-2	14.0	0.64	0.280			GAM
Radium 226	13982-63-3	0.419	0.058	0.052	0.100		GAM
Antimony 125	14234-35-6	U		0.056		U	GAM
Ruthenium 106	13967-48-1	U		0.202		U	GAM
Americium 241	14596-10-2	U		0.103	0.300	U	GAM
Barium 133	13981-41-4	U		0.025		U	GAM
Radium 228	15262-20-1	0.492	0.096	0.098	0.200		GAM
Silver 108m	14391-65-2	U		0.017		U	GAM

Lab id	EBRLNE
Protocol	RIFS-100
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/19/11

DATA SHEET, cont

SDG	7427	Client/Case no	Hanford	SDG K3095
Contact	N. Joseph Verville	Contract	No. S00W235A00	
Lab sample id	S102040-02	Client sample id	B29NH6	
Dept sample id	7427-002	Location/Matrix	C7861(116-H-7);I-012	SOLID
Received	02/03/11	Collected/Weight	01/31/11 14:00	1225 g
% solids	92.4	Custody/SAF No	RC-196-405	RC-196

Soil/Sediment Sampling - 100-H Boreholes

Lab id	EBRLNE
Protocol	RIFS-100
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

Test AM Matrix SOLID
SDG 7427
Contact N. Joseph Verville

LAB METHOD SUMMARY

AMERICIUM 241 IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K3095

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Americium 241	
Preparation batch 7289-144						
S102040-01			7427-001	B29NB3	U	
S102040-02			7427-002	B29NH6	U	
S102040-03			7427-003	Lab Control Sample	ok	
S102040-04			7427-004	Method Blank	U	
S102040-05			7427-005	Duplicate (S102040-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.00	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7289-144			2σ prep error 8.0 %	Reference Lab Notebook No. 7289 pg 144												
S102040-01			B29NB3	0.567	0.500			49		108			39	03/11/11	03/11	SS-037
S102040-02			B29NH6	0.410	0.500			59		108			39	03/11/11	03/11	SS-038
S102040-03			Lab Control Sample	0.510	0.500			50		109				03/11/11	03/11	SS-039
S102040-04			Method Blank	0.585	0.500			38		109				03/11/11	03/11	SS-040
S102040-05			Duplicate (S102040-01)	0.424	0.500			54		109			39	03/11/11	03/11	SS-047
Nominal values and limits from method				1.00	0.500			30-110		100	100		180			

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
	SPP-060	Soil Preparation, rev 0
	CP-965	Americium & Curium in Water & Dissolved Samples by Extraction Chromatography & Microprecipitation, rev 3
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.499 ± 0.160
YIELD 50 ± 16

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

Test PU Matrix SOLID
SDG 7427
Contact N. Joseph Verville

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K3095

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Plutonium 238		Plutonium 239/240	
Preparation batch 7289-144								
S102040-01			7427-001	B29NB3	U		U	
S102040-02			7427-002	B29NH6	U		U	
S102040-03			7427-003	Lab Control Sample	ok		ok	
S102040-04			7427-004	Method Blank	U		U	
S102040-05			7427-005	Duplicate (S102040-01)	-	U	-	U
Nominal values and limits from method				RDLs (pCi/g)	1.00		1.00	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7289-144			2σ prep error 8.0 %	Reference Lab Notebook No. 7289 pg 144												
S102040-01			B29NB3	0.348	0.500			68		105			32	03/04/11	03/04	SS-037
S102040-02			B29NH6	0.342	0.500			59		105			32	03/04/11	03/04	SS-038
S102040-03			Lab Control Sample	0.284	0.500			72		105				03/04/11	03/04	SS-039
S102040-04			Method Blank	0.291	0.500			63		105				03/04/11	03/04	SS-040
S102040-05			Duplicate (S102040-01)	0.316	0.500			65		105			32	03/04/11	03/04	SS-047
Nominal values and limits from method				1.00	0.500			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 5 SAMPLES				
	MDA	0.316	±	0.058
	YIELD	65	±	10

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

Test U Matrix SOLID
SDG 7427
Contact N. Joseph Verville

LAB METHOD SUMMARY

URANIUM, ISOTOPIC IN SOLIDS

ALPHA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K3095

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 7289-144											
S102040-01			7427-001	B29NB3	0.252	U	U				
S102040-02			7427-002	B29NH6	0.482	U	0.512	94	66	0	14
S102040-03			7427-003	Lab Control Sample	ok	ok	ok				
S102040-04			7427-004	Method Blank	U	U	U				
S102040-05			7427-005	Duplicate (S102040-01)	ok U	- U	- U				
Nominal values and limits from method				RDLs (pCi/g)	1.00	1.00	1.00	100		4	
							Averages	94		0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7289-144			2σ prep error 8.0 %	Reference Lab Notebook No. 7289 pg 144												
S102040-01			B29NB3	0.292	0.500			69		107			39	03/11/11	03/11	SS-050
S102040-02			B29NH6	0.279	0.500			81		107			39	03/11/11	03/11	SS-051
S102040-03			Lab Control Sample	0.736	0.500			88		107				03/11/11	03/11	SS-052
S102040-04			Method Blank	0.324	0.500			73		107				03/11/11	03/11	SS-053
S102040-05			Duplicate (S102040-01)	0.289	0.500			82		107			39	03/11/11	03/11	SS-054
Nominal values and limits from method				1.00	0.500			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 5 SAMPLES
MDA 0.384 ± 0.395
YIELD 79 ± 15

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

Test SR Matrix SOLID
SDG 7427
Contact N. Joseph Verville

LAB METHOD SUMMARY

TOTAL STRONTIUM IN SOLIDS

BETA COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K3095

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Total Strontium
Preparation batch 7289-144					
S102040-01			7427-001	B29NB3	U
S102040-02			7427-002	B29NH6	0.616
S102040-03			7427-003	Lab Control Sample	ok
S102040-04			7427-004	Method Blank	U
S102040-05			7427-005	Duplicate (S102040-01)	- U
Nominal values and limits from method				RDLs (pCi/g)	1.00

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7289-144			2σ prep error 10.4 %	Reference Lab Notebook No. 7289 pg 144												
S102040-01			B29NB3	0.268	1.00			92		100			42	03/07/11	03/14	GRB-232
S102040-02			B29NH6	0.290	1.00			91		100			42	03/07/11	03/14	GRB-201
S102040-03			Lab Control Sample	0.270	1.00			87		100				03/07/11	03/14	GRB-202
S102040-04			Method Blank	0.262	1.00			91		100				03/07/11	03/14	GRB-203
S102040-05			Duplicate (S102040-01)	0.265	1.00			92		100			42	03/07/11	03/14	GRB-204
Nominal values and limits from method				1.00	1.00			40-110		100			180			

PROCEDURES

REFERENCE	SRTOT_SEP_PRECIP_GPC	
SPP-061	Determination of Moisture Content in Solid Samples rev 0	
SPP-060	Soil Preparation, rev 0	
SPP-070	Soil Dissolution, < 1.0g Aliquot, rev 1	
CP-383	Strontium in Dissolved Solid of < 5.0g Aliquot, rev 4	

AVERAGES ± 2 SD FOR 5 SAMPLES

MDA 0.271 ± 0.022
YIELD 91 ± 4

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

Test TC Matrix SOLID
SDG 7427
Contact N. Joseph Verville

LAB METHOD SUMMARY

TECHNETIUM 99 IN SOLIDS

BETA COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K3095

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Technetium 99	
Preparation batch 7289-144						
S102040-01			7427-001	B29NB3	U	
S102040-02			7427-002	B29NH6	U	
S102040-03			7427-003	Lab Control Sample	ok	
S102040-04			7427-004	Method Blank	U	
S102040-05			7427-005	Duplicate (S102040-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	0.250	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7289-144			2σ prep error 13.2 %	Reference Lab Notebook No. 7289 pg 144												
S102040-01			B29NB3	0.090	3.00			93		200			40	03/08/11	03/12	GRB-217
S102040-02			B29NH6	0.091	3.00			89		200			42	03/08/11	03/14	GRB-222
S102040-03			Lab Control Sample	0.104	3.00			83		200				03/08/11	03/12	GRB-221
S102040-04			Method Blank	0.092	3.00			89		200				03/08/11	03/14	GRB-223
S102040-05			Duplicate (S102040-01)	0.097	3.00			85		200			40	03/08/11	03/12	GRB-223
Nominal values and limits from method				0.250	3.00			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	
CP-008	Heavy Element Electroplating, rev 13	

AVERAGES ± 2 SD FOR 5 SAMPLES

MDA 0.095 ± 0.012
YIELD 88 ± 8

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

Test GAM Matrix SOLID
SDG 7427
Contact N. Joseph Verville

LAB METHOD SUMMARY

GAMMA SCAN

GAMMA SPECTROSCOPY

Client Hanford
Contract No. S00W235A00
Contract SDG K3095

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Cesium 137	Cobalt 60
Preparation batch 7289-144						
S102040-01			7427-001	B29NB3	U	U
S102040-02			7427-002	B29NH6	0.055	U
S102040-03			7427-003	Lab Control Sample	ok	ok
S102040-04			7427-004	Method Blank	U	U
S102040-05			7427-005	Duplicate (S102040-01)	- U	- U
Nominal values and limits from method				RDLs (pCi/g)	0.100	0.050

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7289-144			2σ prep error 7.0 %	Reference Lab Notebook No. 7289 pg 144												
S102040-01			B29NB3	0.027	688					119			25	02/18/11	02/25	02,02,00
S102040-02			B29NH6	0.075	684					119			25	02/18/11	02/25	02,04,00
S102040-03			Lab Control Sample	0.017	680					119				02/18/11	02/25	01,03,00
S102040-04			Method Blank	0.015	680					119				02/18/11	02/25	MB,08,00
S102040-05			Duplicate (S102040-01)	0.028	688					101			25	02/18/11	02/25	MB,08,00
Nominal values and limits from method				0.050	680					100			180			

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

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 0.032 ± 0.049
YIELD ____ ± ____

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

Test C Matrix SOLID
SDG 7427
Contact N. Joseph Verville

LAB METHOD SUMMARY

CARBON 14 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K3095

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Carbon 14	
Preparation batch 7289-144						
S102040-01			7427-001	B29NB3	U	
S102040-02			7427-002	B29NH6	U	
S102040-03			7427-003	Lab Control Sample	ok	
S102040-04			7427-004	Method Blank	U	
S102040-05			7427-005	Duplicate (S102040-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	50.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7289-144			2σ prep error 10.0 %	Reference Lab Notebook No. 7289 pg 144												
S102040-01			B29NB3	2.20	0.620			100		50			45	03/16/11	03/17	LSC-006
S102040-02			B29NH6	2.14	0.618			100		50			45	03/16/11	03/17	LSC-006
S102040-03			Lab Control Sample	5.10	0.600			100		10				03/16/11	03/17	LSC-006
S102040-04			Method Blank	2.28	0.600			100		50				03/16/11	03/17	LSC-006
S102040-05			Duplicate (S102040-01)	2.15	0.622			100		50			45	03/16/11	03/17	LSC-006
Nominal values and limits from method				50.0	0.600					10			180			

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

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 2.77 ± 2.60
YIELD 100 ± 0

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

Test H Matrix SOLID
SDG 7427
Contact N. Joseph Verville

LAB METHOD SUMMARY

TRITIUM IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K3095

RESULTS

LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	CLIENT SAMPLE ID	Tritium	
Preparation batch 7289-144						
S102040-01			7427-001	B29NB3	U	
S102040-02			7427-002	B29NH6	U	
S102040-03			7427-003	Lab Control Sample	ok	
S102040-04			7427-004	Method Blank	U	
S102040-05			7427-005	Duplicate (S102040-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	10.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF- FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
Preparation batch 7289-144			2σ prep error 10.0 %	Reference Lab Notebook No. 7289 pg 144												
S102040-01			B29NB3	2.80	0.620			100		50			44	03/16/11	03/16	LSC-006
S102040-02			B29NH6	2.87	0.618			100		50			44	03/16/11	03/16	LSC-006
S102040-03			Lab Control Sample	3.19	0.600			100		50				03/16/11	03/17	LSC-006
S102040-04			Method Blank	2.91	0.600			100		50				03/16/11	03/16	LSC-006
S102040-05			Duplicate (S102040-01)	2.82	0.622			100		50			44	03/16/11	03/16	LSC-006
Nominal values and limits from method				10.0	0.600					25			180			

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

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 2.92 ± 0.316
YIELD 100 ± 0

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-LMS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

Test NI L Matrix SOLID
SDG 7427
Contact N. Joseph Verville

LAB METHOD SUMMARY

NICKEL 63 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. S00W235A00
Contract SDG K3095

RESULTS

LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	CLIENT SAMPLE ID	Nickel 63	
Preparation batch 7289-144						
S102040-01			7427-001	B29NB3	U	
S102040-02			7427-002	B29NH6	U	
S102040-03			7427-003	Lab Control Sample	ok	
S102040-04			7427-004	Method Blank	U	
S102040-05			7427-005	Duplicate (S102040-01)	-	U
Nominal values and limits from method				RDLs (pCi/g)	30.0	

METHOD PERFORMANCE

LAB SAMPLE ID	RAW TEST	SUF-FIX	CLIENT SAMPLE ID	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7289-144			2σ prep error 11.2 %	Reference Lab Notebook No. 7289 pg 144												
S102040-01			B29NB3	2.92	0.500			96		50			44	03/11/11	03/16	LSC-007
S102040-02			B29NH6	3.08	0.500			91		50			44	03/11/11	03/16	LSC-007
S102040-03			Lab Control Sample	2.89	0.500			95		50				03/11/11	03/16	LSC-007
S102040-04			Method Blank	3.03	0.500			92		50				03/11/11	03/16	LSC-007
S102040-05			Duplicate (S102040-01)	2.92	0.500			96		50			44	03/11/11	03/16	LSC-007
Nominal values and limits from method				30.0	0.500			40-110		25			180			

PROCEDURES
REFERENCE NI63_LSC
SPP-071 Soil Dissolution, > 1.0g Aliquot, rev 1
CP-281 Nickel-63 Purification By Extraction Chromatography, rev 5

AVERAGES ± 2 SD FOR 5 SAMPLES
MDA 2.97 ± 0.165
YIELD 94 ± 5

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Form DVD-LMS
Version 3.06
Report date 03/19/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3095

SDG 7427
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K3095

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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Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 03/19/11

SDG 7427
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG_K3095

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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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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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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DUPLICATE

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.

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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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MATRIX SPIKE

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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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'

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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.

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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

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 03/19/11

SDG 7427
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K3095

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.

Lab id EBRLNE
Protocol RIFS-100
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 03/19/11

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-196-362	PAGE 1 OF 1
COLLECTOR Glover, Karen	**COMPANY CONTACT** KESSNER, JH K3095	**TELEPHONE NO.** 375-4688 (7427)	**PROJECT COORDINATOR** KESSNER, JH	**PRICE CODE** 8N	**DATA TURNAROUND**
SAMPLING LOCATION C7861 (116-H-7); I-003 EB	**PROJECT DESIGNATION** Soil/Sediment Sampling - 100-H Boreholes		**SAF NO.** RC-196	**AIR QUALITY** ☐	45 Days / 45 Days
ICE CHEST NO. GWS-237	**FIELD LOGBOOK NO.** HNF-N-585-2 Pg 83	**ACTUAL SAMPLE DEPTH** N/A	**COA** 302509ES10	**METHOD OF SHIPMENT** FEDERAL EXPRESS	
SHIPPED TO Eberline Services	**OFFSITE PROPERTY NO.** SEE PTR		**BILL OF LADING/AIR BILL NO.** SEE PTR	7943786 60592	

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

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

SPECIAL HANDLING AND/OR STORAGE
~~RADIOACTIVE TIE TO: B29N98~~ MVH 12/2/10

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	PRESERVATION	HOLDING TIME	TYPE OF CONTAINER	NO. OF CONTAINER(S)	VOLUME	SAMPLE ANALYSIS
				None	6 Months	G/P	1	500mL	SEE ITEM (1) IN SPECIAL INSTRUCTIONS
				None	6 Months	G/P	1	60mL	Carbon-14 (100 Area RIFS);
				None	6 Months	G/P	1	60mL	Isotopic Plutonium (100 Area RI/FS);
				None	6 Months	G/P	1	60mL	Nickel-63 (100 Area RIFS);
B29NB3	SOIL	1-31-11	0710	✓	✓	✓			✓

CHAIN OF POSSESSION	SIGN/ PRINT NAMES		
RELINQUISHED BY/REMOVED FROM: E. Glover	DATE/TIME: 1-31-11 / 1615	RECEIVED BY/STORED IN: MO413 SSU-R4	DATE/TIME: 1-31-11 / 1615
RELINQUISHED BY/REMOVED FROM: SSU-R4	DATE/TIME: FEB 01 2011 0715	RECEIVED BY/STORED IN: M. A. White	DATE/TIME: FEB 01 2011 0715
RELINQUISHED BY/REMOVED FROM: M. A. White	DATE/TIME: FEB 01 2011 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: FED EX	DATE/TIME:	RECEIVED BY/STORED IN: Alex Kellerd / KELENSON	DATE/TIME: 2/3/11 1050
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME:
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME:
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME:

SPECIAL INSTRUCTIONS
** The laboratory is to achieve a detection limit of 10 pCi/g for Tritium.☐☐** The laboratory is to achieve a detection limit of 0.25 pCi/g for Technetium.
(1) Gamma Spec (100 Area RIFS); Americium-241 (100 Area RIFS); Isotopic Uranium (100 Area RIFS); Strontium-89,90 -- Total Sr (100 Area RIFS); Technetium-99 (100 Area RI/FS); Tritium - H3 (100 Area RI/FS);

☐ ORIGINAL

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		RC-196-405	PAGE 1 OF 1
COLLECTOR KAUSH, KAUSH, ANDERSON	**COMPANY CONTACT** KESSNER, JH K3095	**TELEPHONE NO.** 375-4688 (7427)	**PROJECT COORDINATOR** KESSNER, JH	**PRICE CODE** 8N **AIR QUALITY** ☐
SAMPLING LOCATION C7861 (116-H-7); I-012	**PROJECT DESIGNATION** Soil/Sediment Sampling - 100-H Boreholes		**SAF NO.** RC-196	**DATA TURNAROUND** 45 Days / 45 Days
ICE CHEST NO. GWS-237	**FIELD LOGBOOK NO.** HNF-N-585-2 PG83	**ACTUAL SAMPLE DEPTH** 35.0 to 37.5 FT	**COA** 302509ES10	**METHOD OF SHIPMENT** FEDERAL EXPRESS
SHIPPED TO Eberline Services	**OFFSITE PROPERTY NO.** SEE PTR		**BILL OF LADING/AIR BILL NO.** SEE PTR	7943786 60592

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

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

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	None	None	None	None
HOLDING TIME	6 Months	6 Months	6 Months	6 Months
TYPE OF CONTAINER	G/P	G/P	G/P	G/P
NO. OF CONTAINER(S)	1	1	1	1
VOLUME	500mL	60mL	60mL	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	Carbon-14 (100 Area RIFS);	Isotopic Plutonium (100 Area RI/FS);	Nickel-63 (100 Area RIFS);
SAMPLE NO.	**MATRIX***	**SAMPLE DATE**	**SAMPLE TIME**				
B29NH6	SOIL	1-31-11	1400	✓	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
E Kaush E Kaush	1-31-11 1615	MO-413 SSU-R4	1-31-11 1615
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
SSU-R4	FEB 01 2011 0715	M. A. White Mawhite	FEB 01 2011 0715
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
M. A. White Mawhite	FEB 01 2011 1400	FEDEX	
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
FED EX		Rex Kelley KELLENSON	2/3/11 1030
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**
RELINQUISHED BY/REMOVED FROM	**DATE/TIME**	**RECEIVED BY/STORED IN**	**DATE/TIME**

SPECIAL INSTRUCTIONS

** The laboratory is to achieve a detection limit of 10 pCi/g for Tritium.☐☐** The laboratory is to achieve a detection limit of 0.25 pCi/g for Technetium.
(1) Gamma Spec (100 Area RIFS); Americium-241 (100 Area RIFS); Isotopic Uranium (100 Area RIFS); Strontium-89,90 -- Total Sr (100 Area RIFS); Technetium-99 (100 Area RI/FS); Tritium - H3 (100 Area RI/FS);

ORIGINAL

LABORATORY SECTION	**RECEIVED BY**		**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**		**DISPOSED BY**	**DATE/TIME**

A-6003-618 (REV 2)

EBERLINE SERVICES

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: CHPRC City RICHLAND State WA

Date/Time received 2/3/11 10:30 CoC No. RC-196-362-405

Container I.D. No. GWS-237 Requested TAT (Days) 45 P.O. Received Yes [ ] No [ ]

INSPECTION

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

    _____

    _____

    _____
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date _____
15. Inspected by JK Date: 2/3/11 Time: 13:30

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

Ion Chamber Ser. No. _____ Calibration date _____

Alpha Meter Ser. No. _____ Calibration date _____

Beta/Gamma Meter Ser. No. 100482 Calibration date 24 Sep. 2010