

SAF-RC-041
300 Area D4 Waste Characterization
Sampling - Water
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

No Distribution Required

KW 7/27/11
INITIAL/DATE

COMMENTS:

SDG K3436

SAF-RC-041

Rad only

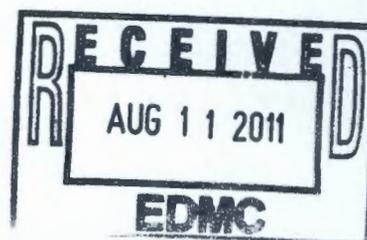
Chem only

Rad & Chem

Complete

Partial

Sample Location/Waste Site: 308 Pit Run 131





EBERLINE

SERVICES

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July 22, 2011

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

Reference: **P.O. #S00W235A00**
Eberline Analytical S1-06-147-7726, SDG K3436

Dear Ms. Kessner:

Enclosed is the data report for one water sample designated under SAF No. RC-041. The sample was received at Eberline Analytical on June 29, 2011. 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/ijb
Enclosure: Data Package

1.0 GENERAL

Washington Closure Hanford (WCH) Sample Delivery Group K3436 was composed of one water sample designated under SAF No. RC-041 with a Project Designation of: 300 Area D4 Waste Characterization Sampling – Water.

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 July 22, 2011.

2.0 ANALYSIS NOTES

2.1 Isotopic Thorium Analysis

No problems were encountered during the course of the analyses.

2.2 Isotopic Uranium Analysis

No problems were encountered during the course of the analyses.

2.3 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 splitting the plating solution, the apparent tracer yields are low and the resultant MDA's are greater than the RDL. No other problems were encountered during the course of the analyses.

2.4 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 splitting the plating solution, the apparent tracer yields are low and the resultant MDA's are greater than the RDL. No other problems were encountered during the course of the analyses.

2.5 Americium-241 Analysis

No problems were encountered during the course of the analyses.

2.6 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

7/22/11

Date

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K3436

SDG 7726
Contact N. Joseph Verville

Client Hanford
Contract No. S00W235A00
Case no SDG_K3436

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

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VB
Prepared by _____

M. Pucci
Reviewed by _____

Lab id EBRLNE
Protocol RC-041
Version Ver 1.0
Form DVD-TOC
Version 3.06
Report date 07/22/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3436

SDG 7726
Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
Contract No. S00W235A00
Case no SDG K3436

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol RC-041
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/22/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3436

SDG 7726
Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
Contract No. S00W235A00
Case no SDG K3436

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol RC-041
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/22/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3436

LAB SAMPLE SUMMARY

SDG 7726
Contact N.Joseph Verville

Client Hanford
Contract No. S00W235A00
Case no SDG K3436

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S106147-01	J1JWK3	308 Pit Rm 131	WATER		RC-041	RC-041-044	06/27/11 12:45
S106147-02	Lab Control Sample		WATER		RC-041		
S106147-03	Method Blank		WATER		RC-041		
S106147-04	Duplicate (S106147-01)	308 Pit Rm 131	WATER		RC-041		06/27/11 12:45

LAB SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol RC-041
Version Ver 1.0
Form DVD-LS
Version 3.06
Report date 07/22/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3436

SDG 7726
 Contact N.Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3436

QC SUMMARY

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7726	RC-041-044	J1JWK3	WATER		3.0 L		06/29/11 2	S106147-01		7726-001
		Method Blank	WATER					S106147-03		7726-003
		Lab Control Sample	WATER					S106147-02		7726-002
		Duplicate (S106147-01)	WATER		3.0 L		06/29/11 2	S106147-04		7726-004

QC SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol RC-041
 Version Ver 1.0
 Form DVD-QS
 Version 3.06
 Report date 07/22/11

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3436

SDG 7726
 Contact N.Joseph Verville

PREP BATCH SUMMARY

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3436

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI- FIERS	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Alpha Spectroscopy										
AM	WATER	Americium 241 in Liquid	7296-095	8.0	1			1	1	1/1
PU	WATER	Plutonium, Isotopic in Water	7296-095	8.0	1			1	1	1/1
TH	WATER	Thorium, Isotopic in Water	7296-095	8.0	1			1	1	1/1
U	WATER	Uranium in Liquid	7296-095	8.0	1			1	1	1/1
Gamma Spectroscopy										
GAM	WATER	Gamma Emitters	7296-095	7.0	1			1	1	1/1
Liquid Scintillation Counting										
PU_L	WATER	Plutonium 241 in Water	7296-095	12.4	1			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.

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3436

SDG 7726
 Contact N. Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3436

LAB WORK SUMMARY

LAB SAMPLE	CLIENT SAMPLE ID				SUF-					
COLLECTED	LOCATION	MATRIX			FIX	ANALYZED	REVIEWED	BY	METHOD	
RECEIVED	CUSTODY	SAF No	PLANCHET	TEST						
S106147-01	J1JWK3		7726-001	AM		07/21/11	07/21/11	KWP	Americium 241 in Liquid	
06/27/11	308 Pit Rm 131		7726-001	GAM		07/05/11	07/06/11	CSS	Gamma Emitters	
06/29/11	RC-041-044	RC-041	7726-001	PU		07/20/11	07/20/11	BW	Plutonium, Isotopic in Water	
			7726-001	PU_L		07/20/11	07/21/11	KWP	Plutonium 241 in Water	
			7726-001	TH		07/18/11	07/18/11	BW	Thorium, Isotopic in Water	
			7726-001	U		07/15/11	07/15/11	KWP	Uranium in Liquid	
S106147-02	Lab Control Sample		7726-002	AM		07/21/11	07/21/11	KWP	Americium 241 in Liquid	
			7726-002	GAM		07/06/11	07/06/11	CSS	Gamma Emitters	
		RC-041	7726-002	PU		07/20/11	07/20/11	BW	Plutonium, Isotopic in Water	
			7726-002	PU_L		07/20/11	07/21/11	KWP	Plutonium 241 in Water	
			7726-002	TH		07/18/11	07/18/11	BW	Thorium, Isotopic in Water	
			7726-002	U		07/15/11	07/15/11	KWP	Uranium in Liquid	
S106147-03	Method Blank		7726-003	AM		07/21/11	07/21/11	KWP	Americium 241 in Liquid	
			7726-003	GAM		07/06/11	07/06/11	CSS	Gamma Emitters	
		RC-041	7726-003	PU		07/20/11	07/20/11	BW	Plutonium, Isotopic in Water	
			7726-003	PU_L		07/20/11	07/21/11	KWP	Plutonium 241 in Water	
			7726-003	TH		07/18/11	07/18/11	BW	Thorium, Isotopic in Water	
			7726-003	U		07/15/11	07/15/11	KWP	Uranium in Liquid	
S106147-04	Duplicate (S106147-01)		7726-004	AM		07/21/11	07/21/11	KWP	Americium 241 in Liquid	
06/27/11	308 Pit Rm 131		7726-004	GAM		07/06/11	07/06/11	CSS	Gamma Emitters	
06/29/11		RC-041	7726-004	PU		07/20/11	07/20/11	BW	Plutonium, Isotopic in Water	
			7726-004	PU_L		07/20/11	07/21/11	KWP	Plutonium 241 in Water	
			7726-004	TH		07/18/11	07/18/11	BW	Thorium, Isotopic in Water	
			7726-004	U		07/15/11	07/15/11	KWP	Uranium in Liquid	

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol RC-041
 Version Ver 1.0
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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3436

WORK SUMMARY, cont.

SDG 7726
 Contact N. Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3436

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
AM	RC-041	Americium 241 in Liquid	AMCMISO_IE_PLATE_AEA	1			1	1	1	4
GAM	RC-041	Gamma Emitters	GAMMA_GS	1			1	1	1	4
PU	RC-041	Plutonium, Isotopic in Water	PUISO_PLATE_AEA	1			1	1	1	4
PU_L	RC-041	Plutonium 241 in Water	PU241_IE_LSC	1			1	1	1	4
TH	RC-041	Thorium, Isotopic in Water	THISO_IE_PLATE_AEA	1			1	1	1	4
U	RC-041	Uranium in Liquid	UIISO_PLATE_AEA	1			1	1	1	4
TOTALS				6			6	6	6	24

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE
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 Form DVD-LWS
 Version 3.06
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EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K3436

7726-003

Method Blank

BLANK, cont.

SDG <u>7726</u>	Client/Case no <u>Hanford</u>	SDG <u>K3436</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S106147-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7726-003</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>RC-041</u>	

QC-BLANK #78956

Lab id <u>EBRLNE</u>
Protocol <u>RC-041</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>07/22/11</u>

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3436

7726-002

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7726</u> Contact <u>N.Joseph Verville</u> Lab sample id <u>S106147-02</u> Dept sample id <u>7726-002</u>	Client/Case no <u>Hanford</u> <u>SDG K3436</u> Contract No. <u>S00W235A00</u> Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>WATER</u> SAF No <u>RC-041</u>
--	--

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/L	(COUNT)	pCi/L	pCi/L	FIERS TEST	pCi/L	pCi/L	%	(TOTAL)	LIMITS
Americium 241	17.1	2.1	0.490	1.00	AM	16.9	0.68	101	77-123	80-120
Thorium 230	15.5	1.9	0.551	1.00	TH	18.9	0.76	82	81-119	80-120
Uranium 233/234	18.1	2.2	0.429	1.00	U	19.7	0.79	92	79-121	80-120
Uranium 238	20.4	2.4	0.429	1.00	U	19.7	0.79	104	77-123	80-120
Plutonium 238	16.5	3.0	0.984	1.00	PU	19.0	0.76	87	73-127	80-120
Plutonium 239/240	20.6	3.3	0.786	1.00	PU	22.0	0.88	94	74-126	80-120
Plutonium 241	451	30	<u>36.9</u>	15.0	PU_L	523	21	86	81-119	80-120
Cobalt 60	494	23	9.12	25.0	GAM	480	19	103	86-114	80-120
Cesium 137	516	21	13.4	15.0	GAM	498	20	104	86-114	80-120

QC-LCS #78955

Lab id <u>EBRLNE</u>
Protocol <u>RC-041</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
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Report date <u>07/22/11</u>

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3436

7726-004

J1JWK3

DUPLICATE

SDG <u>7726</u>	Client/Case no <u>Hanford</u>	SDG <u>K3436</u>
Contact <u>N.Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>S106147-04</u>	Lab sample id <u>S106147-01</u>	Client sample id <u>J1JWK3</u>
Dept sample id <u>7726-004</u>	Dept sample id <u>7726-001</u>	Location/Matrix <u>308 Pit Rm 131</u> <u>WATER</u>
	Received <u>06/29/11</u>	Collected/Volume <u>06/27/11 12:45</u> <u>3.0 L</u>
		Custody/SAF No <u>RC-041-044</u> <u>RC-041</u>

ANALYTE	DUPLICATE		MDA		RDL		QUALI-		ORIGINAL		MDA		QUALI-		RPD %	3σ TOT	DER σ
	pCi/L	2σ ERR (COUNT)	pCi/L		pCi/L		FIERS	TEST	pCi/L	2σ ERR (COUNT)	pCi/L		FIERS				
Americium 241	0.136	0.18	0.434		1.00		U	AM	0	0.18	0.421		U	-		1.1	
Thorium 228	0.025	0.15	0.278		1.00		U	TH	0	0.052	0.199		U	-		0.3	
Thorium 230	0.176	0.30	0.480		1.00		U	TH	-0.182	0.26	0.497		U	-		1.8	
Thorium 232	0	0.050	0.192		1.00		U	TH	0	0.052	0.199		U	-		0	
Uranium 233/234	0.100	0.10	0.382		1.00		U	U	0.081	0.081	0.308		U	-		0.3	
Uranium 235	0.060	0.12	0.462		1.00		U	U	0.049	0.098	0.373		U	-		0.1	
Uranium 238	0	0.10	0.382		1.00		U	U	0	0.081	0.308		U	-		0	
Plutonium 238	-0.111	0.44	<u>1.06</u>		1.00		U	PU	0.241	0.48	0.924		U	-		1.1	
Plutonium 239/240	0.222	0.22	0.849		1.00		U	PU	0	0.24	0.923		U	-		1.4	
Plutonium 241	-4.18	23	<u>38.9</u>	15.0			U	PU_L	-2.69	17	<u>28.4</u>		U	-		0.1	
Potassium 40	U		66.9				U	GAM	U		48.4		U	-		0.4	
Cobalt 60	U		5.03	25.0			U	GAM	U		4.85		U	-		0.1	
Zinc 65	U		9.83				U	GAM	U		9.89		U	-		0	
Cesium 137	U		4.92	15.0			U	GAM	U		4.71		U	-		0.1	
Radium 226	U		10.3				U	GAM	U		16.9		U	-		0.7	
Radium 228	U		19.5				U	GAM	U		19.2		U	-		0	
Europium 152	U		11.3	50.0			U	GAM	U		11.9		U	-		0.1	
Europium 154	U		14.0	50.0			U	GAM	U		14.3		U	-		0	
Europium 155	U		10.9	50.0			U	GAM	U		10.1		U	-		0.1	
Thorium 228	U		8.72				U	GAM	U		8.64		U	-		0	
Thorium 232	U		19.5				U	GAM	U		19.2		U	-		0	
Uranium 235	U		25.1	50.0			U	GAM	U		23.8		U	-		0.1	
Uranium 238	U		<u>618</u>	500			U	GAM	U		<u>548</u>		U	-		0.2	
Americium 241	U		6.34	50.0			U	GAM	U		6.26		U	-		0	
Niobium 94	U		4.20				U	GAM	U		4.43		U	-		0.1	
Ruthenium 106	U		41.5				U	GAM	U		42.8		U	-		0	
Antimony 125	U		10.8				U	GAM	U		10.2		U	-		0.1	
Cesium 134	U		6.00				U	GAM	U		5.76		U	-		0.1	

DUPLICATES

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>RC-041</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>07/22/11</u>

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3436

7726-004

J1JWK3

DUPLICATE, cont.

SDG <u>7726</u>	Client/Case no <u>Hanford</u>	<u>SDG K3436</u>
Contact <u>N.Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>S106147-04</u>	Lab sample id <u>S106147-01</u>	Client sample id <u>J1JWK3</u>
Dept sample id <u>7726-004</u>	Dept sample id <u>7726-001</u>	Location/Matrix <u>308 Pit Rm 131</u> <u>WATER</u>
	Received <u>06/29/11</u>	Collected/Volume <u>06/27/11 12:45</u> <u>3.0 L</u>
		Custody/SAF No <u>RC-041-044</u> <u>RC-041</u>

ANALYTE	DUPLICATE pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ORIGINAL pCi/L	2σ ERR (COUNT)	MDA pCi/L	QUALI- FIERS	RPD %	3σ TOT	DER σ
Cerium 144	U		22.0		U	GAM	U		21.2	U	-		0.1

QC-DUP#1 78957

300 Area D4 Waste Characteriazation Sampling - Water

DUPLICATES

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SUMMARY DATA SECTION

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Protocol <u>RC-041</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>07/22/11</u>

EBERLINE ANALYTICAL / RICHMOND
SAMPLE DELIVERY GROUP K3436

7726-001

J1JWK3

DATA SHEET

SDG <u>7726</u>	Client/Case no <u>Hanford</u>	SDG <u>K3436</u>
Contact <u>N.Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S106147-01</u>	Client sample id <u>J1JWK3</u>	
Dept sample id <u>7726-001</u>	Location/Matrix <u>308 Pit Rm 131</u>	<u>WATER</u>
Received <u>06/29/11</u>	Collected/Volume <u>06/27/11 12:45</u>	<u>3.0 L</u>
	Custody/SAF No <u>RC-041-044</u>	<u>RC-041</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Americium 241	14596-10-2	0	0.18	0.421	1.00	U	AM
Thorium 228	14274-82-9	0	0.052	0.199	1.00	U	TH
Thorium 230	14269-63-7	-0.182	0.26	0.497	1.00	U	TH
Thorium 232	TH-232	0	0.052	0.199	1.00	U	TH
Uranium 233/234	U-233/234	0.081	0.081	0.308	1.00	U	U
Uranium 235	15117-96-1	0.049	0.098	0.373	1.00	U	U
Uranium 238	U-238	0	0.081	0.308	1.00	U	U
Plutonium 238	13981-16-3	0.241	0.48	0.924	1.00	U	PU
Plutonium 239/240	PU-239/240	0	0.24	0.923	1.00	U	PU
Plutonium 241	14119-32-5	-2.69	17	<u>28.4</u>	15.0	U	PU_L
Potassium 40	13966-00-2	U		48.4		U	GAM
Cobalt 60	10198-40-0	U		4.85	25.0	U	GAM
Zinc 65	13982-39-3	U		9.89		U	GAM
Cesium 137	10045-97-3	U		4.71	15.0	U	GAM
Radium 226	13982-63-3	U		16.9		U	GAM
Radium 228	15262-20-1	U		19.2		U	GAM
Europium 152	14683-23-9	U		11.9	50.0	U	GAM
Europium 154	15585-10-1	U		14.3	50.0	U	GAM
Europium 155	14391-16-3	U		10.1	50.0	U	GAM
Thorium 228	14274-82-9	U		8.64		U	GAM
Thorium 232	TH-232	U		19.2		U	GAM
Uranium 235	15117-96-1	U		23.8	50.0	U	GAM
Uranium 238	U-238	U		<u>548</u>	500	U	GAM
Americium 241	14596-10-2	U		6.26	50.0	U	GAM
Niobium 94	14681-63-1	U		4.43		U	GAM
Ruthenium 106	13967-48-1	U		42.8		U	GAM
Antimony 125	14234-35-6	U		10.2		U	GAM
Cesium 134	13967-70-9	U		5.76		U	GAM

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EBERLINE ANALYTICAL / RICHMOND
 SAMPLE DELIVERY GROUP K3436

7726-001

J1JWK3

DATA SHEET, cont

SDG <u>7726</u>	Client/Case no <u>Hanford</u>	SDG <u>K3436</u>
Contact <u>N. Joseph Verville</u>	Contract No. <u>S00W235A00</u>	
Lab sample id <u>S106147-01</u>	Client sample id <u>J1JWK3</u>	
Dept sample id <u>7726-001</u>	Location/Matrix <u>308 Pit Rm 131</u>	<u>WATER</u>
Received <u>06/29/11</u>	Collected/Volume <u>06/27/11 12:45</u>	<u>3.0 L</u>
	Custody/SAF No <u>RC-041-044</u>	<u>RC-041</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Cerium 144	14762-78-8	U		21.2		U	GAM

300 Area D4 Waste Characteriazation Sampling - Water

Lab id <u>EBRLNE</u>
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Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3436

LAB METHOD SUMMARY

AMERICIUM 241 IN LIQUID
ALPHA SPECTROSCOPY

Test AM Matrix WATER
SDG 7726
Contact N.Joseph Verville

Client Hanford
Contract No. S00W235A00
Contract SDG K3436

RESULTS

LAB	RAW	SUF-		Americium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	241
Preparation batch 7296-095				
S106147-01		7726-001	J1JWK3	U
S106147-02		7726-002	Lab Control Sample	ok
S106147-03		7726-003	Method Blank	U
S106147-04		7726-004	Duplicate (S106147-01)	- U

Nominal values and limits from method RDLs (pCi/L) 1.00

METHOD PERFORMANCE

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-	
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD PREPARED	YZED	DETECTOR
Preparation batch 7296-095 2σ prep error 8.0 % Reference Lab Notebook 7296 pg. 095														
S106147-01		J1JWK3	0.421	0.312			88		109		24	07/21/11	07/21	SS-035
S106147-02		Lab Control Sample	0.490	0.300			86		109			07/21/11	07/21	SS-036
S106147-03		Method Blank	0.518	0.300			78		110			07/21/11	07/21	SS-037
S106147-04		Duplicate (S106147-01)	0.434	0.312			86		110		24	07/21/11	07/21	SS-038

Nominal values and limits from method 1.00 0.300 30-110 50 100 180

PROCEDURES	REFERENCE	AMCMISO_IE_PLATE_AEA
SPP-040	Environmental Water Dissolution, rev 2	
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	MDA	<u>0.466</u> ± <u>0.092</u>
FOR 4 SAMPLES	YIELD	<u>84</u> ± <u>9</u>

METHOD SUMMARIES

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EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3436

Test PU Matrix WATER
 SDG 7726
 Contact N.Joseph Verville

LAB METHOD SUMMARY

PLUTONIUM, ISOTOPIC IN WATER

ALPHA SPECTROSCOPY

Client Hanford
 Contract No. S00W235A00
 Contract SDG K3436

RESULTS

LAB	RAW	SUF-		Plutonium	Plutonium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	238	239/240

Preparation batch 7296-095

S106147-01	7726-001	J1JWK3		U	U
S106147-02	7726-002	Lab Control Sample		ok	ok
S106147-03	7726-003	Method Blank		U	U
S106147-04	7726-004	Duplicate (S106147-01)		- U	- U

Nominal values and limits from method RDLs (pCi/L) 1.00 1.00

METHOD PERFORMANCE

LAB	RAW	SUF-	MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR

Preparation batch 7296-095 2σ prep error 8.0 % Reference Lab Notebook 7296 pg. 095

S106147-01	J1JWK3		0.924	0.312			32		111			23	07/20/11	07/20	SS-035
S106147-02	Lab Control Sample		0.984	0.300			37		111				07/20/11	07/20	SS-036
S106147-03	Method Blank		0.912	0.300			35		111				07/20/11	07/20	SS-037
S106147-04	Duplicate (S106147-01)		<u>1.06</u>	0.312			35		111			23	07/20/11	07/20	SS-038

Nominal values and limits from method 1.00 0.300 30-110 100 100 180

PROCEDURES	REFERENCE	PUISO_PLATE_AEA
SPP-040	Environmental Water Dissolution, rev 2	
CP-941	Plutonium in Water and Dissolved Samples by Extraction Chromatography, rev 12	
CP-008	Heavy Element Electroplating, rev 13	

AVERAGES ± 2 SD	MDA <u>0.970</u> ± <u>0.136</u>
FOR 4 SAMPLES	YIELD <u>35</u> ± <u>4</u>

METHOD SUMMARIES

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SAMPLE DELIVERY GROUP K3436

Test TH Matrix WATER
 SDG 7726
 Contact N.Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Contract SDG K3436

LAB METHOD SUMMARY

THORIUM, ISOTOPIC IN WATER
 ALPHA SPECTROSCOPY

RESULTS

LAB	RAW	SUF-					
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	Thorium 228	Thorium 230	Thorium 232	
Preparation batch 7296-095							
S106147-01		7726-001	J1JWK3	U	U	U	
S106147-02		7726-002	Lab Control Sample		ok		
S106147-03		7726-003	Method Blank	U	U	U	
S106147-04		7726-004	Duplicate (S106147-01)	- U	- U	- U	
Nominal values and limits from method				RDLs (pCi/L)	1.00	1.00	1.00

METHOD PERFORMANCE

LAB	RAW	SUF-		MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID		pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7296-095 2σ prep error 8.0 % Reference Lab Notebook 7296 pg. 095																
S106147-01		J1JWK3		0.497	0.312			95		162			21	07/18/11	07/18	SS-056
S106147-02		Lab Control Sample		0.551	0.300			94		162				07/18/11	07/18	SS-057
S106147-03		Method Blank		0.583	0.300			75		162				07/18/11	07/18	SS-058
S106147-04		Duplicate (S106147-01)		0.480	0.312			91		162			21	07/18/11	07/18	SS-061
Nominal values and limits from method				1.00	0.300			30-110		150	100		180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
SPP-062		Sample Aliquoting, rev 1
SPP-040		Environmental Water Dissolution, rev 2
CP-900		Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 5
CP-008		Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD	MDA	<u>0.528</u> ± <u>0.095</u>
FOR 4 SAMPLES	YIELD	<u>89</u> ± <u>19</u>

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3436

Test U Matrix WATER
 SDG 7726
 Contact N.Joseph Verville

LAB METHOD SUMMARY

URANIUM IN LIQUID
 ALPHA SPECTROSCOPY

Client Hanford
 Contract No. S00W235A00
 Contract SDG K3436

RESULTS

LAB	RAW	SUF-		1: Uranium	2: Uranium	3: Uranium	RESULT RATIOS (%)			
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	233/234	235	238	1+3	2σ	2+3	2σ
Preparation batch 7296-095										
S106147-01		7726-001	J1JWK3	U	U	U				
S106147-02		7726-002	Lab Control Sample	ok		ok				
S106147-03		7726-003	Method Blank	U	U	U				
S106147-04		7726-004	Duplicate (S106147-01)	- U	- U	- U				

Nominal values and limits from method	RDLs (pCi/L)	1.00	1.00	1.00	Averages
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METHOD PERFORMANCE

LAB	RAW	SUF-	MAX MDA	ALIQ	PREP	DILU-	YIELD	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT SAMPLE ID	pCi/L	L	FAC	TION	%	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7296-095 2σ prep error 8.0 % Reference Lab Notebook 7296 pg. 095															
S106147-01		J1JWK3	0.373	0.312			87		104			18	07/15/11	07/15	SS-002
S106147-02		Lab Control Sample	0.429	0.300			90		104				07/15/11	07/15	SS-003
S106147-03		Method Blank	0.433	0.300			80		105				07/15/11	07/15	SS-005
S106147-04		Duplicate (S106147-01)	0.462	0.312			81		105			18	07/15/11	07/15	SS-006

Nominal values and limits from method	1.00	0.300	30-110	100	180
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PROCEDURES	REFERENCE	UIISO_PLATE_AEA
	SPP-040	Environmental Water Dissolution, rev 2
	CP-921	Uranium in Water and Dissolved Samples by Extraction Chromatography, rev 5
	CP-008	Heavy Element Electroplating, rev 13

AVERAGES ± 2 SD	MDA	<u>0.424</u> ± <u>0.074</u>
FOR 4 SAMPLES	YIELD	<u>84</u> ± <u>10</u>

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REPORT GUIDE

Client Hanford
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Case no SDG K3436

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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SAMPLE DELIVERY GROUP K3436

SDG 7726
 Contact N.Joseph Verville

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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.

REPORT GUIDES

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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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
Protocol RC-041
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/22/11

SDG 7726
 Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3436

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

Lab id EBRLNE
 Protocol RC-041
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 07/22/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3436

SDG 7726

Contact N. Joseph Verville

Client Hanford

Contract No. S00W235A00

Case no SDG K3436

GUIDE, cont.

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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE

Protocol RC-041

Version Ver 1.0

Form DVD-RG

Version 3.06

Report date 07/22/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3436

SDG 7726
 Contact N. Joseph Verville

REPORT GUIDE

Client Hanford
 Contract No. S00W235A00
 Case no SDG_K3436

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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 Protocol RC-041
 Version Ver 1.0
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 Report date 07/22/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3436

SDG 7726
 Contact N. Joseph Verville

GUIDE, cont.

Client Hanford
 Contract No. S00W235A00
 Case no SDG_K3436

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.
- * Preparation 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.

REPORT GUIDES

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SUMMARY DATA SECTION

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Lab id EBRLNE
 Protocol RC-041
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EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3436

SDG 7726
 Contact N. Joseph Verville

Client Hanford
 Contract No. S00W235A00
 Case no SDG K3436

GUIDE, cont.

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 RC-041
 Version Ver 1.0
 Form DVD-RG
 Version 3.06
 Report date 07/22/11

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3436

SDG 7726
Contact N. Joseph Verville

GUIDE , c o n t .

Client Hanford
Contract No. S00W235A00
Case no SDG_K3436

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.

REPORT GUIDES

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SUMMARY DATA SECTION

Page 35

Lab id EBRLNE
Protocol RC-041
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 07/22/11

Collector: K Hulse
 Company Contact: Mike Stankovich Telephone No.: 509.430.7142
 Project Coordinator: KESSNER, JH
 Price Code: 7K Data Turnaround: 15 Days

Project Designation: 300 Area D4 Waste Characterization Sampling - Water
 Sampling Location: 308 Pit Rm 131 **K3436 (7726)**
 SAF No.: RC-041

Ice Chest No.: **GWS-002**
 Field Logbook No.: EL-1518-20 COA: RD4MXX2F00
 Method of Shipment: Fedex
 Shipped To: **EBERLINE SERVICES LIONVILLE**
 Offsite Property No.: **2778**
 Bill of Lading/Air Bill No.: **7949 17781955**

POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive	Preservation	HNO3 to pH <2	HNO3 to pH <2	HNO3 to pH <2	None	none	none	none	none	none
	Type of Container	G/P	G/P	G/P	G/P	G/P	P	P	P	P
	Special Handling and/or Storage <i>Radio - 51JWK3</i>	No. of Container(s)	<i>1/2</i>	<i>1/2</i>	0	<i>1/2</i>	0	0	0	0
	Volume	<i>500mL</i>	1000mL	250mL	100mL	1				

SAMPLE ANALYSIS				See item (1) in Special Instructions	See item (2) in Special Instructions	Isotopic Plutonium	REPGA Shipping Screen	Isotopic Pu-241	Isotopic Am-241	Isotopic U	Isotopic Th
-----------------	--	--	--	--------------------------------------	--------------------------------------	--------------------	-----------------------	-----------------	-----------------	------------	-------------

Sample No.	Matrix *	Sample Date	Sample Time							
J1JWK3	WATER	6-27-11	1245	✓	✓		✓	✓	✓	✓

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From <i>KH Hulse</i>	Date/Time <i>6-27-11/1430</i>	Received By/Stored In <i>SSU I</i>	Date/Time <i>6-27-11/1430</i>
Relinquished By/Removed From <i>SSU I</i>	Date/Time <i>JUN 28 2011 0800</i>	Received By/Stored In <i>DW Brotherton, Jr</i>	Date/Time <i>JUN 28 2011 0800</i>
Relinquished By/Removed From <i>DW Brotherton, Jr</i>	Date/Time <i>JUN 28 2011 1410</i>	Received By/Stored In <i>FED EX</i>	Date/Time
Relinquished By/Removed From <i>FED EX</i>	Date/Time	Received By/Stored In <i>F. MATHIAS</i>	Date/Time <i>06/29/11 0930</i>
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

(1) ICP Metals - 6010TR (Client List) {Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc}; Mercury - 7470 - (CV)
 (2) Gamma Spec (Client List) {Americium-241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Ruthenium-106, Zinc-65}

Samples are not preserved

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

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



RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: W.C. HANFORD City MCHLAND State WA
 Date/Time received 06/29/11 0900 CoC No. RC-041-044
 Container I.D. No. QWS-002 Requested TAT (Days) 15 P.O. Received Yes [] No []

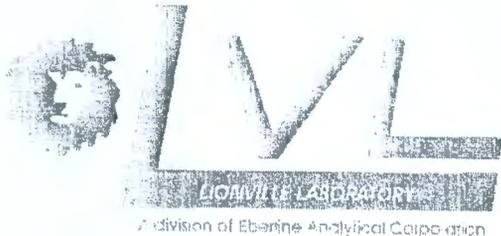
INSPECTION

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 []
6. Number of samples in shipping container: 1 Sample Matrix W
7. Number of containers per sample: 3 (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 6 Preservative _____
13. Describe any anomalies:

14. Was P.M. notified of any anomalies? Yes [] No [] Date _____
 15. Inspected by [Signature] Date: 06/29/11 Time: 1030

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wide	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wide
JJWK3	<80						

Ion Chamber Ser. No. _____ Calibration date _____
 Alpha Meter Ser. No. _____ Calibration date _____
 Beta/Gamma Meter Ser. No. 100482 Calibration date 24 SEP 10



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

7 July 2011

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H9-03
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 #	1106110
SDG #	K3436
SAF #	RC-041
Date Received	06/29/11
# Samples	1
Matrix	WATER
Volatiles	
Semivolatiles	
Pest/PCB	
Glycols	
DRO/KRO/GRO	
PAHs	
Herbicides	
Metals	X
Inorganics	

The electronic data deliverable (EDD) has been emailed. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,

Lionville Laboratory
A Division of Eberline Analytical Corporation

Orlette S. Johnson
Project Manager



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

WC-Hanford, Inc.
2620 Fermi Avenue
Richland WA, 99354

Project: RC-041
Project Number: K3436
Project Manager: Joan Kessner

Reported:
07/05/2011 16:28

Analytical Report for Metals by SW846 6000/7000 series

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1JWK3	1106110-01	Water	06/27/2011 12:45	06/29/2011 09:30



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

Case Narrative

Client: WC-HANFORD RC-041
LVL#: 1106110
SDG/SAF#: K3436/RC-041

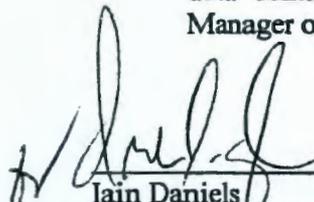
W.O.#: 60049-001-001-0001-00
Date Received: 06-29-11

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.
3. All analyses were performed within the required holding times.
4. Please refer to the Sample Receipt Check List for any sample discrepancies in LvL's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the LOQ).
7. The preparation/method blank for 2 analytes were outside method criteria. {less than the Limit of Quantitation (3-10X the LOD), samples were greater than 20X MB value}.
 - a). The MB results for Aluminum and Calcium were greater than the Limit of Quantitation (LOQ) {3-10x the (LOD) Limit of Detection} and all samples read less than 20 times the MB concentration. The preparation/method blank L106274-BLK1 result for Calcium was below the client requested limit. The preparation/method blank L106274-BLK1 result for Aluminum was slightly above the client requested limit. The sample results for Aluminum and Calcium were reported herein "uncorrected" for the levels found in the MB.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits.
10. All matrix spike (MS) recoveries were within the 75-125% control limits.

11. The duplicate analyses for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limit criteria. The $\pm 20\%$ RPD control limit applies to sample results greater 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

7/6/11

Date

alm/06-110



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

WC-Hanford, Inc.
2620 Fermi Avenue
Richland WA, 99354

Project: RC-041
Project Number: K3436
Project Manager: Joan Kessner

Reported:
07/05/2011 16:28

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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Project: RC-041
 Project Number: K3436
 Project Manager: Joan Kessner

Reported:
 07/05/2011 16:28

J1JWK3
1106110-01 (Water)

Analyte	Result and Qualifier	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method
Lionville Laboratory								
Metals by SW846 6000/7000 series								
Mercury	0.200 U	0.200	ug/L	1	L106294	06/30/2011	07/01/2011	7470A
Aluminum	282	50.0	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Antimony	15.0 U	15.0	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Arsenic	10.0 U	10.0	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Barium	5.61	2.00	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Beryllium	1.00 U	1.00	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Cadmium	0.397 B	1.00	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Calcium	1560	100	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Chromium	4.25	2.00	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Copper	3.55 B	10.0	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Iron	3560	50.0	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Lead	173	10.0	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Magnesium	79.9 B	100	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Manganese	845	2.00	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Nickel	19.1	5.00	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Potassium	18900	500	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Selenium	10.0 U	10.0	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Silicon	932	50.0	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Silver	5.00 U	5.00	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Sodium	68200	100	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Uranium	100 U	100	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Vanadium	1.01 B	5.00	ug/L	1	L106274	06/29/2011	06/30/2011	6010B
Zinc	42.5	20.0	ug/L	1	L106274	06/29/2011	06/30/2011	6010B



264 Welsh Pool Roa
Exton, PA 1934
Phone: 610-280-300
Fax: 610-280-304

WC-Hanford, Inc.
2620 Fermi Avenue
Richland WA, 99354

Project: RC-041
Project Number: K3436
Project Manager: Joan Kessner

Reported:
07/05/2011 16:28

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 L106274 - SW 3005A									
Blank (L106274-BLK1)					Prepared: 06/29/2011 Analyzed: 06/30/2011				
Aluminum	53.4	50.0	ug/L						
Antimony	15.0 U	15.0	ug/L						
Arsenic	10.0 U	10.0	ug/L						
Barium	2.00 U	2.00	ug/L						
Beryllium	1.00 U	1.00	ug/L						
Cadmium	1.00 U	1.00	ug/L						
Calcium	118	100	ug/L						
Chromium	2.00 U	2.00	ug/L						
Copper	10.0 U	10.0	ug/L						
Iron	50.0 U	50.0	ug/L						
Lead	10.0 U	10.0	ug/L						
Magnesium	100 U	100	ug/L						
Manganese	2.00 U	2.00	ug/L						
Nickel	5.00 U	5.00	ug/L						
Potassium	500 U	500	ug/L						
Selenium	10.0 U	10.0	ug/L						
Silicon	50.0 U	50.0	ug/L						
Silver	5.00 U	5.00	ug/L						
Sodium	100 U	100	ug/L						
Uranium	100 U	100	ug/L						
Vanadium	5.00 U	5.00	ug/L						
Zinc	20.0 U	20.0	ug/L						
LCS (L106274-BS1)									
					Prepared: 06/29/2011 Analyzed: 06/30/2011				
Aluminum	4900	50.0	ug/L	5000.0	98	80-120		20	
Antimony	3100	15.0	ug/L	3000.0	103	80-120		20	
Arsenic	10200	10.0	ug/L	10000	102	80-120		20	
Barium	4940	2.00	ug/L	5000.0	99	80-120		20	
Beryllium	241	1.00	ug/L	250.00	96	80-120		20	
Cadmium	247	1.00	ug/L	250.00	99	80-120		20	
Calcium	24300	100	ug/L	25000	97	80-120		20	
Chromium	487	2.00	ug/L	500.00	97	80-120		20	
Copper	1270	10.0	ug/L	1250.0	102	80-120		20	
Iron	4990	50.0	ug/L	5000.0	100	80-120		20	
Lead	2470	10.0	ug/L	2500.0	99	80-120		20	
Magnesium	24600	100	ug/L	25000	99	80-120		20	
Manganese	766	2.00	ug/L	750.00	102	80-120		20	



264 Welsh Pool Road
Exton, PA 1934
Phone: 610-280-3000
Fax: 610-280-304

WC-Hanford, Inc.
2620 Fermi Avenue
Richland WA, 99354

Project: RC-041
Project Number: K3436
Project Manager: Joan Kessner

Reported:
07/05/2011 16:28

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 L106274 - SW 3005A									
LCS (L106274-BS1)				Prepared: 06/29/2011 Analyzed: 06/30/2011					
Nickel	2000	5.00	ug/L	2000.0	100	80-120		20	
Potassium	24900	500	ug/L	25000	100	80-120		20	
Selenium	10300	10.0	ug/L	10000	103	80-120		20	
Silicon	5120	50.0	ug/L	5000.0	102	80-120		20	
Silver	492	5.00	ug/L	500.00	98	80-120		20	
Sodium	25400	100	ug/L	25000	102	80-120		20	
Uranium	4920	100	ug/L	5000.0	98	80-120		20	
Vanadium	2490	5.00	ug/L	2500.0	99	80-120		20	
Zinc	996	20.0	ug/L	1000.0	100	80-120		20	
Duplicate (L106274-DUP1)		Source: 1106110-01		Prepared: 06/29/2011 Analyzed: 06/30/2011					
Aluminum	196	50.0	ug/L		282			36*	20
Antimony	15.0 U	15.0	ug/L		15.0 U				20
Arsenic	10.0 U	10.0	ug/L		10.0 U				20
Barium	5.27	2.00	ug/L		5.61			6	20
Beryllium	1.00 U	1.00	ug/L		1.00 U				20
Cadmium	0.418 B	1.00	ug/L		0.397			5	20
Calcium	1380	100	ug/L		1560			12	20
Chromium	3.95	2.00	ug/L		4.25			7	20
Copper	3.94 B	10.0	ug/L		3.55			11	20
Iron	3580	50.0	ug/L		3560			0.5	20
Lead	177	10.0	ug/L		173			2	20
Magnesium	72.0 B	100	ug/L		79.9			10	20
Manganese	854	2.00	ug/L		845			1	20
Nickel	19.3	5.00	ug/L		19.1			0.9	20
Potassium	19000	500	ug/L		18900			0.7	20
Selenium	10.0 U	10.0	ug/L		10.0 U				20
Silicon	948	50.0	ug/L		932			2	20
Silver	5.00 U	5.00	ug/L		5.00 U				20
Sodium	69000	100	ug/L		68200			1	20
Uranium	100 U	100	ug/L		100 U				20
Vanadium	5.00 U	5.00	ug/L		1.01				20
Zinc	43.5	20.0	ug/L		42.5			2	20

000000007



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

WC-Hanford, Inc.
2620 Fermi Avenue
Richland WA, 99354

Project: RC-041
Project Number: K3436
Project Manager: Joan Kessner

Reported:
07/05/2011 16:28

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 L106274 - SW 3005A									
Matrix Spike (L106274-MS1)									
Source: 1106110-01 Prepared: 06/29/2011 Analyzed: 06/30/2011									
Aluminum	2170	50.0	ug/L	2000.0	282	94	75-125		20
Antimony	514	15.0	ug/L	500.00	15.0 U	103	75-125		20
Arsenic	2080	10.0	ug/L	2000.0	10.0 U	104	75-125		20
Barium	2020	2.00	ug/L	2000.0	5.61	101	75-125		20
Beryllium	49.3	1.00	ug/L	50.000	1.00 U	99	75-125		20
Cadmium	50.1	1.00	ug/L	50.000	0.397	99	75-125		20
Calcium	26400	100	ug/L	25000	1560	99	75-125		20
Chromium	206	2.00	ug/L	200.00	4.25	101	75-125		20
Copper	263	10.0	ug/L	250.00	3.55	104	75-125		20
Iron	4580	50.0	ug/L	1000.0	3560	102	75-125		20
Lead	657	10.0	ug/L	500.00	173	97	75-125		20
Magnesium	25100	100	ug/L	25000	79.9	100	75-125		20
Manganese	1340	2.00	ug/L	500.00	845	99	75-125		20
Nickel	515	5.00	ug/L	500.00	19.1	99	75-125		20
Potassium	45200	500	ug/L	25000	18900	105	75-125		20
Selenium	2050	10.0	ug/L	2000.0	10.0 U	103	75-125		20
Silicon	1950	50.0	ug/L	1000.0	932	101	75-125		20
Silver	51.3	5.00	ug/L	50.000	5.00 U	103	75-125		20
Sodium	95000	100	ug/L	25000	68200	107	75-125		20
Uranium	5070	100	ug/L	5000.0	100 U	101	75-125		20
Vanadium	514	5.00	ug/L	500.00	1.01	103	75-125		20
Zinc	551	20.0	ug/L	500.00	42.5	102	75-125		20

Batch L106294 - SW 7470A Prep

Blank (L106294-BLK1)										
Prepared: 06/30/2011 Analyzed: 07/01/2011										
Mercury	0.200	U	0.200	ug/L						



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

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-041 Project Number: K3436 Project Manager: Joan Kessner	Reported: 07/05/2011 16:28
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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 L106294 - SW 7470A Prep									
LCS (L106294-BS1)					Prepared: 06/30/2011 Analyzed: 07/01/2011				
Mercury	4.65	0.200	ug/L	5.0606		91.9	80-120		
Duplicate (L106294-DUP2)					Source: 1106110-01 Prepared: 06/30/2011 Analyzed: 07/01/2011				
Mercury	0.200 U	0.200	ug/L		0.200 U				20
Matrix Spike (L106294-MS2)					Source: 1106110-01 Prepared: 06/30/2011 Analyzed: 07/01/2011				
Mercury	0.868	0.200	ug/L	1.0061	0.200 U	86.3	75-125		

SAMPLE DIGESTION RECORD

Digestion Batch #: L106374
 Date/Time Initiated: 6/29/11 1140
 Date/Time Completed: 6/29/11 1710
 Analyst: JJS
 Matrix (circle): Soil Water Other
 Method (circle one): 3005A 3010A 3050 200.7 (1994)
 pH/Turbidity: N/A for Solids.

~~Digested~~ / Undigested (circle one)
 Balance #: not
 Balance Cal Verification: Y (NA)
 Temp: 96
 BLOCK 1 2 (circle one)

NOTE: All temperatures are recorded as corrected temperatures

Work Order #	Spike Vol (mL)	Initial Wt/Vol (g/mL)	Final Vol (mL)	pH <2	Type: To/Sol/TC	Texture	Color / Appearance	Artifact	Turb
1106110-01		50	50	5.2	70	N/A	clear / Brown	N/A	N/A
* 1106374-001		50	50	5.2					
* -M21	0.5	50	50	5.2			CL		
-M21		50	50				CL		
* -M21	0.5	50	50				CL		

JJS
6/29/11

Spiking IDs / Expiration Date:

MS#: 1001843

LCS#: 1100240

Reagent IDs:

HNO₃ K14036

HCl K14054

H₂O₂ _____

1:1 HNO₃ _____

1:1 HCl _____

File ID#: _____

Data Review By/Date:

QJM 6/30/11

Analyst: M. Kelly
 Date: 6/30/11
 Start Time/Temp: 1600/93°
 End Time/Temp: 1800/97°

Instrument ID: H63.2
 Balance #: AKA
 Pipette Calibration (Daily) Y

Prep Batch: L106294
 Worksheet: H6070102
 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	
ICV		0.0835	2.5	33	33	
CV		0.167	5.0	33	33	
ICB/CVB				33	33	
L106294-BLK1				33	33	
BS1		0.167	5.0	33	33	
1106095-01	<			33	33	
L106294-DUP1	<			33	33	
MS1	<	0.333	1.0	33	33	
1106110-01	<			33	33	
L106294-DUP2	<			33	33	
MS2	<	0.333	1.0	33	33	
1106120-07	<			33	33	
1106125-01	<			33	33	
L106294-DUP3	<			33	33	
MS3	<	0.333	1.0	33	33	
<u>MW 6/30/11</u>						

Standard:	ID	Prep Date/Time
ICAL/MS	RI 1001785B	6/30/11 1000
ICV/CCV/LCS	ICV 1001781A	2

Reviewed By/Date: AKM 7/5/11

Soil LCS True Value = AKA mg/Kg
 Standard # _____

see book # 9368 for std traceability information
 Water Matrix Spiking Solution Concentration = 0.1 µg/ml
 after LCS Spiking Concentration: 1.0 µg/ml

1100114

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-041-044		Page 1 of 1	
Collector K Hulse		Company Contact Mike Stankovich		Telephone No. 509.430.7142		Project Coordinator KESSNER, JH		Price Code 7K Data Turnaround 15 Days	
Project Designation 300 Area D4 Waste Characterization Sampling - Water		Sampling Location 308 Pit Rm 131		SAF No. RC-041					
Ice Chest No. GWS-236		Field Logbook No. EL-1518-20		COA RD4MXX2F00		Method of Shipment Fedex			
Shipped To EBERLINE SERVICES / MONVILLE		Offsite Property No. 2779		Bill of Lading/Air Bill No. 794917793341					
POSSIBLE SAMPLE HAZARDS/REMARKS Radioactive			Preservation	HNO3 to pH < 2	HNO3 to pH < 2	HNO3 to pH < 2	None		
Special Handling and/or Storage Rad to J1JWK3			Type of Container	G/P	G/P	G/P	G/P		
			No. of Container(s)	1	3	0	1		
			Volume	500mL	1000mL	250mL	1000mL		
SAMPLE ANALYSIS				See item (1) in Special Instructions.	See item (2) in Special Instructions.	Isotopic Plutonium	RCF GEA Shipping Screen		
Sample No.	Matrix *	Sample Date	Sample Time						
J1JWK3	WATER	6-27-11	1245	✓					
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		(1) ICP Metals - 6010TR (Client List) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Uranium, Vanadium, Zinc); Mercury - 7470 - (CV) (2) Gamma Spec (Client List) (Americium-241, Antimony-125, Cerium-144, Cesium-134, Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155, Niobium-94, Radium-226, Ruthenium-106, Zinc-65) Sample is not preserved	
K.B. Hulse		6-27-11/1430		SSU 1		6-27-11/1430			
D.W. Brotherton, Jr.		JUN 28 2011		D.W. Brotherton, Jr.		JUN 28 2011			
D.W. Brotherton, Jr.		JUN 28 2011		CHPRC		JUN 28 2011			
Fed. El.		6-29-11 0930		Victor Hernandez		6-29-11 0930			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue W=Wipe L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
LABORATORY SECTION		Received By		Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time	

000000013

Lionville Laboratory
SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford
 Project/SAF/SOW/Release #: RC-041

Date: 6/29/11

LvL Batch #: 1106110

Sample Custodian: Walter Hernandez

NOTE: EXPLAIN ALL DISCREPANCIES

- | | | |
|--|--|---|
| 1. Samples Hand Delivered or Shipped? | Carrier <u>Fed Ex</u> | Airbill # <u>7949 1778 1955</u> |
| 2. Custody Seals on coolers or shipping containers intact, signed & dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals |
| 3. Outside of coolers or shipping containers are free from damage? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | Comments: |
| 4. All expected paperwork received (coc & other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 5. Samples received cooled or ambient? | Temp <u>3.1</u> °C | Cooler # <u>GW5-236</u> |
| How was the temperature taken? | <input checked="" type="checkbox"/> IR <input type="checkbox"/> Temp. Blank | <input type="checkbox"/> Other (Specify) |
| Is the Temp. Criteria met for these samples? (Hg in soils @ 4°C) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 6. Custody seals on sample containers intact, signed and dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> No Seals |
| 7. COC (Client & LvL) signed & dated? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 8. Sample containers are intact? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 9. All samples on COC received?
All samples received on COC? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 10. All sample label information matches COC? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 11. Samples properly preserved? (If #5 is no. then this is no.) | <input checked="" type="checkbox"/> Yes
<u>5 7/5/11</u> | <input checked="" type="checkbox"/> No <u>PHCC metals added 4ml of HNO3</u> |
| 12. Samples received within hold times?
Short holds taken to wet lab? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
<input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| 13. VOA, TOC, TOX free of headspace? | <input type="checkbox"/> Yes <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A |
| 14. QC stickers placed on bottles designated by client? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> 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.) | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | |
| 16. Project Manager contacted concerning any discrepancies?
Person Contacted <u>O. Johnson</u> | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No | <input type="checkbox"/> N/A
Date _____ |