

1212400

**SAF-RC-111**  
**3730 Building Gamma Irradiation**  
**Facility – Semi-Annual Sampling**  
**FINAL DATA PACKAGE**

**COMPLETE COPY OF DATA PACKAGE TO:**

No Distribution Required

**COMMENTS:**

**SDG K3810**

**SAF-RC-111**

Rad only

Chem only

Rad & Chem

Complete

Partial

Sample Location/Waste Site: 3730 Gamma Pit





# EBERLINE SERVICES

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February 15, 2012

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



Reference: **P.O. #S00W235A01**  
**Eberline Analytical S2-02-048-7879 SDG K3810**

Dear Ms. Kessner:

Enclosed is the data report for one water sample designated under SAF No. RC-111. The sample was received at Eberline Analytical on February 8, 2012. The sample was analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Joseph Verville  
Client Services Manager

NJV/mw

Enclosure: Data Package

**1.0 GENERAL**

Washington Closure Hanford (WCH) Sample Delivery Group K3810 was composed of one water sample designated under SAF No. RC-111 with a Project Designation of: 3730 Building Gamma Irradiation Facility – Semi-Annual Sample.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Analytical Sample Receipt Checklist. The results were transmitted to WCH via e-mail on February 15, 2012.

**2.0 ANALYSIS NOTES**

**2.1 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."**



\_\_\_\_\_  
Joseph Verville  
Client Services Manager

2/15/12

\_\_\_\_\_  
Date

EBERLINE ANALYTICAL / RICHMOND  
SAMPLE DELIVERY GROUP K3810

SDG 7879  
Contact Joseph Verville

Client Hanford  
Contract No. S00W235A01  
Case no SDG\_K3810

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

T A B L E   O F   C O N T E N T S				
About this section	.	.	.	1
Sample Summaries	.	.	.	3
Prep Batch Summary	.	.	.	5
Work Summary	.	.	.	6
Method Blanks	.	.	.	7
Lab Control Samples	.	.	.	8
Duplicates	.	.	.	9
Data Sheets	.	.	.	10
Method Summaries	.	.	.	11
Report Guides	.	.	.	12
End of Section	.	.	.	26

*Joseph Verville*  
Prepared by

*J. Verville*  
Reviewed by

Lab id EBRLNE  
Protocol Hanford1  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

REPORT GUIDE

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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.

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
Contact Joseph Verville

GUIDE, cont.

Client Hanford  
Contract No. S00W235A01  
Case no SDG K3810

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

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

MATRIX SPIKES

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

DATA SHEETS

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

METHOD SUMMARIES

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

REPORT GUIDES

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

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

LAB SAMPLE SUMMARY

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
S202048-01	J1NJP4	3730 Gamma Pit	WATER		RC-111	RC-111-006	02/06/12 09:10
S202048-02	Lab Control Sample		WATER		RC-111		
S202048-03	Method Blank		WATER		RC-111		
S202048-04	Duplicate (S202048-01)	3730 Gamma Pit	WATER		RC-111		02/06/12 09:10

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-LS  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

QC SUMMARY

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	LAB COLL	DEPARTMENT SAMPLE ID
7879	RC-111-006	J1NJP4	WATER		1.0 L		02/08/12 2	S202048-01	7879-001
		Method Blank	WATER					S202048-03	7879-003
		Lab Control Sample	WATER					S202048-02	7879-002
		Duplicate (S202048-01)	WATER		1.0 L		02/08/12 2	S202048-04	7879-004

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-QS  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

PREP BATCH SUMMARY

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

TEST MATRIX	METHOD	PREPARATION ERROR BATCH	2σ %	CLIENT	MORE	PLANCHETS ANALYZED			QUALI- FIERS
						RE	BLANK	LCS	
Gamma Spectroscopy									
GAM	WATER	Gamma Emitters	7321-153	7.0	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.

Lab id EBRINE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-PBS  
 Version 3.06  
 Report date 02/15/12

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

**LAB WORK SUMMARY**

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

LAB SAMPLE	CLIENT SAMPLE ID				SUF-					
COLLECTED	LOCATION	MATRIX	FLANCHET	TEST	FIX	ANALYZED	REVIEWED	BY	METHOD	
RECEIVED	CUSTODY	SAF No								
S202048-01	J1NJP4		7879-001	GAM		02/08/12	02/15/12	BW	Gamma Emitters	
02/06/12	3730 Gamma Pit	WATER								
02/08/12	RC-111-006	RC-111								
S202048-02	Lab Control Sample		7879-002	GAM		02/14/12	02/15/12	BW	Gamma Emitters	
		WATER								
		RC-111								
S202048-03	Method Blank		7879-003	GAM		02/08/12	02/15/12	BW	Gamma Emitters	
		WATER								
		RC-111								
S202048-04	Duplicate (S202048-01)		7879-004	GAM		02/09/12	02/15/12	BW	Gamma Emitters	
02/06/12	3730 Gamma Pit	WATER								
02/08/12		RC-111								

**COUNTS OF TESTS BY SAMPLE TYPE**

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
GAM	RC-111	Gamma Emitters	GAMMA_GS	1			1	1	1		4
TOTALS				1			1	1	1		4

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-LWS  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND  
SAMPLE DELIVERY GROUP K3810

7879-003

Method Blank

METHOD BLANK

SDG <u>7879</u>	Client/Case no <u>Hanford</u>	SDG <u>K3810</u>
Contact <u>Joseph Verville</u>	Contract No. <u>S00W235A01</u>	
Lab sample id <u>S202048-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7879-003</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>RC-111</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Potassium 40	13966-00-2	U		66.5		U	GAM
Cobalt 60	10198-40-0	U		5.08	25.0	U	GAM
Cesium 137	10045-97-3	U		4.43	15.0	U	GAM
Europium 152	14683-23-9	U		11.2	50.0	U	GAM
Europium 154	15585-10-1	U		15.5	50.0	U	GAM
Europium 155	14391-16-3	U		10.4	50.0	U	GAM
Radium 226	13982-63-3	U		9.56		U	GAM
Radium 228	15262-20-1	U		19.0		U	GAM
Thorium 228	14274-82-9	U		7.06		U	GAM
Thorium 232	TH-232	U		19.0		U	GAM
Uranium 235	15117-96-1	U		23.0		U	GAM
Uranium 238	U-238	U		576		U	GAM
Americium 241	14596-10-2	U		14.2	400	U	GAM

QC-BLANK #81088

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP K3810

7879-002

Lab Control Sample

**LAB CONTROL SAMPLE**

SDG <u>7879</u> Contact <u>Joseph Verville</u>  Lab sample id <u>S202048-02</u> Dept sample id <u>7879-002</u>	Client/Case no <u>Hanford</u> <u>SDG K3810</u> Contract No. <u>S00W235A01</u>  Client sample id <u>Lab Control Sample</u> Material/Matrix <u>WATER</u> SAF No <u>RC-111</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
Cobalt 60	380	22	14.5	25.0	GAM	442	18	<u>86</u>	87-113	80-120
Cesium 137	404	19	12.6	15.0	GAM	492	20	<u>82</u>	88-112	80-120

QC-LCS #81087

**EBERLINE ANALYTICAL/RICHMOND**

SAMPLE DELIVERY GROUP K3810

7879-004

J1NJP4

**DUPLICATE**

<u>SDG 7879</u>	<u>Client/Case no Hanford</u>	<u>SDG K3810</u>
<u>Contact Joseph Verville</u>	<u>Contract No. 900W235A01</u>	
<u>DUPLICATE</u>	<u>ORIGINAL</u>	
<u>Lab sample id S202048-04</u>	<u>Lab sample id S202048-01</u>	<u>Client sample id J1NJP4</u>
<u>Dept sample id 7879-004</u>	<u>Dept sample id 7879-001</u>	<u>Location/Matrix 3730 Gamma Pit WATER</u>
	<u>Received 02/08/12</u>	<u>Collected/Volume 02/06/12 09:10 1.0 L</u>
		<u>Custody/SAF No RC-111-006 RC-111</u>

ANALYTE	DUPLICATE	2σ ERR	MDA	RDL	QUALI-	ORIGINAL	2σ ERR	MDA	QUALI-	RPD	3σ	DER
	pCi/L	(COUNT)	pCi/L	pCi/L	FIERS TEST		pCi/L	(COUNT)	pCi/L	FIERS	%	TOT
Potassium 40	U		80.3		U	GAM	U	56.7	U	-		0.5
Cobalt 60	U		7.51	25.0	U	GAM	U	5.31	U	-		0.5
Cesium 137	U		7.31	15.0	U	GAM	U	5.24	U	-		0.5
Europium 152	U		20.2	50.0	U	GAM	U	12.1	U	-		0.7
Europium 154	U		18.9	50.0	U	GAM	U	15.4	U	-		0.3
Europium 155	U		21.8	50.0	U	GAM	U	11.2	U	-		0.9
Radium 226	U		28.2		U	GAM	U	11.4	U	-		1.1
Radium 228	U		32.6		U	GAM	U	21.0	U	-		0.6
Thorium 228	U		13.9		U	GAM	U	6.93	U	-		0.9
Thorium 232	U		32.6		U	GAM	U	21.0	U	-		0.6
Uranium 235	U		48.4		U	GAM	U	25.5	U	-		0.8
Uranium 238	U		1030		U	GAM	U	642	U	-		0.6
Americium 241	U		42.4	400	U	GAM	U	7.07	U	-		1.6

QC-DUP#1 81089

3730 Building Gamma Irradiation Facility - Semi-Annual Sample

EBERLINE ANALYTICAL / RICHMOND  
SAMPLE DELIVERY GROUP K3810

7879-001

J1NJP4

DATA SHEET

SDG <u>7879</u>	Client/Case no <u>Hanford</u>	SDG <u>K3810</u>
Contact <u>Joseph Verville</u>	Contract No. <u>S00W235A01</u>	
Lab sample id <u>S202048-01</u>	Client sample id <u>J1NJP4</u>	
Dept sample id <u>7879-001</u>	Location/Matrix <u>3730 Gamma Pit</u>	<u>WATER</u>
Received <u>02/08/12</u>	Collected/Volume <u>02/06/12 09:10</u>	<u>1.0 L</u>
	Custody/SAF No <u>RC-111-006</u>	<u>RC-111</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Potassium 40	13966-00-2	U		56.7		U	GAM
Cobalt 60	10198-40-0	U		5.31	25.0	U	GAM
Cesium 137	10045-97-3	U		5.24	15.0	U	GAM
Europium 152	14683-23-9	U		12.1	50.0	U	GAM
Europium 154	15585-10-1	U		15.4	50.0	U	GAM
Europium 155	14391-16-3	U		11.2	50.0	U	GAM
Radium 226	13982-63-3	U		11.4		U	GAM
Radium 228	15262-20-1	U		21.0		U	GAM
Thorium 228	14274-82-9	U		6.93		U	GAM
Thorium 232	TH-232	U		21.0		U	GAM
Uranium 235	15117-96-1	U		25.5		U	GAM
Uranium 238	U-238	U		642		U	GAM
Americium 241	14596-10-2	U		7.07	400	U	GAM

3730 Building Gamma Irradiation Facility - Semi-Annual Sample

Lab id <u>EBRLNE</u>
Protocol <u>Hanford1</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>02/15/12</u>

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3810

Test GAM Matrix WATER  
 SDG 7879  
 Contact Joseph Verville

LAB METHOD SUMMARY

GAMMA EMITTERS  
 GAMMA SPECTROSCOPY

Client Hanford  
 Contract No. S00W235A01  
 Contract SDG K3810

RESULTS

LAB RAW SUP-  
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Cobalt 60 Cesium 137

Preparation batch 7321-153

S202048-01	7879-001	J1NJP4		U	U
S202048-02	7879-002	Lab Control Sample		LOW	LOW
S202048-03	7879-003	Method Blank		U	U
S202048-04	7879-004	Duplicate (S202048-01)		- U	- U

Nominal values and limits from method RDLs (pCi/L) 25.0 15.0

METHOD PERFORMANCE

LAB RAW SUP- 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 7321-153 2σ prep error 7.0 % Reference Lab Notebook 7321 pg. 128

S202048-01	J1NJP4		20.8	0.500					951		2	02/08/12	02/08	01,01,00
S202048-02	Lab Control Sample		12.6	0.500					360			02/08/12	02/14	01,03,00
S202048-03	Method Blank		18.0	0.500					951			02/08/12	02/08	01,04,00
S202048-04	Duplicate (S202048-01)		36.6	0.500					307		3	02/08/12	02/09	MB,08,00

Nominal values and limits from method 15.0 0.500 100 180

PROCEDURES REFERENCE GAMMA\_GS  
 SPP-007 Aqueous Sample Receipt by Chemistry Laboratory, rev 1  
 SPP-100 Preparation of Sample for Gamma Spectroscopy, rev 0

AVERAGES ± 2 SD MDA 22.0 ± 20.6  
 FOR 4 SAMPLES YIELD \_\_\_\_\_ ± \_\_\_\_\_

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

REPORT GUIDE

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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.

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

REPORT GUIDE

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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.

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

REPORT GUIDE

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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.

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

REPORT GUIDE

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG\_K3810

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).

REPORT GUIDES

Page 4

SUMMARY DATA SECTION

Page 15

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

GUIDE, cont.

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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.

Lab id EBRINE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

GUIDE, cont.

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG\_K3810

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.

Lab id EBRLINE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

REPORT GUIDE

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG\_K3810

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.

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

REPORT GUIDE

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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.

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL/RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

GUIDE, cont.

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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.

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

REPORT GUIDE

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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.

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
Contact Joseph Verville

GUIDE, cont.

Client Hanford  
Contract No. S00W235A01  
Case no SDG K3810

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.

Lab id EBRLNE  
Protocol Hanford1  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

REPORT GUIDE

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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'

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

GUIDE, cont.

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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.

Lab id EBRLNE  
 Protocol Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

GUIDE, cont.

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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 Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

REPORT GUIDES

Page 14

SUMMARY DATA SECTION

Page 25

EBERLINE ANALYTICAL / RICHMOND

SAMPLE DELIVERY GROUP K3810

SDG 7879  
 Contact Joseph Verville

GUIDE, cont.

Client Hanford  
 Contract No. S00W235A01  
 Case no SDG K3810

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 Hanford1  
 Version Ver 1.0  
 Form DVD-RG  
 Version 3.06  
 Report date 02/15/12

Washington Closure Hanford		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				RC-111-006		Page 1 of 1	
Collector <u>Ron Holen</u>		Company Contact Tom Edmundson		Telephone No. 509.947.5192		Project Coordinator KESSNER, JH		Price Code <u>7L</u> Data Turnaround <b>15 Days</b>	
Project Designation 3730 Building Gamma Irradiation Facility - Semi-Annual Sa		Sampling Location 3730 Gamma Pit		<u>K3810 (7879)</u>		SAF No. RC-111			
Ice Chest No. <u>GWS-075</u>		Field Logbook No. EL-1518-25		COA RD4MXX2F00		Method of Shipment Fed Ex			
Shipped To <u>BERLINE SERVICES/ LIONVILLE</u>		Offsite Property No. <u>A110 144</u>		Bill of Lading/Air Bill No. <u>See OSPL ems 2-6-12</u>					
POSSIBLE SAMPLE HAZARDS/REMARKS <u>Potential Rad &lt; DOT Limits RSM 2-7-12</u>				Preservation	Cool 4C	HNO3 to pH <u>2</u>	None		
Special Handling and/or Storage <u>Cool 4 degree C</u>				Type of Container	P	P/G	G/P		
				No. of Container(s)	1	1	1		
				Volume	1000mL	1000mL	25ml		
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Gamma Spec - Add-on (Cobalt-60)	RC/GEA Shipping Screen			
Sample No.	Matrix *	Sample Date	Sample Time						
J1NJP4	WATER	2-6-12	0916						
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By/Removed From <u>Ron Holen</u>		Date/Time <u>2-6-12 0935</u>		Received By/Stored In <u>M0767 Fridge</u>		Date/Time <u>2-6-12 0935</u>		<p>(1) IC Anions - 300.0 (Chloride); Conductivity - 120.1 (Specific Conductance); pH (Water) - 9040 (pH Measurement)</p> <p><b>REVIEWED BY</b> <u>JRC</u> <b>DATE</b> <u>2-7-12</u></p> <p>S=Soil SE=Settlement SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Dryum Solids DL=Dryum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other</p>	
Relinquished By/Removed From <u>M0767 Fridge</u>		Date/Time <u>2-7-12 1240</u>		Received By/Stored In <u>Fed Ex</u>		Date/Time			
Relinquished By/Removed From <u>Fed Ex</u>		Date/Time		Received By/Stored In <u>RF. WATHAN</u>		Date/Time <u>02/08/12 0930</u>			
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			
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 RICHMOND State WA  
 Date/Time received 02/08/12 0930 CoC No. RC-111-006  
 Container I.D. No. GWS-075 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: 1 (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 2 Preservative HNO<sub>3</sub>
13. Describe any anomalies:  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date \_\_\_\_\_  
 15. Inspected by [Signature] Date: 02/08/12 Time: 0930

Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	Wipe	Customer Sample No.	Beta/Gamma cpm	Ion Chamber mR/hr	wipe
JINJPK	<80	0.027					

Ion Chamber Ser. No. 1198 Calibration date 15 JUN 11  
 Alpha Meter Ser. No. \_\_\_\_\_ Calibration date \_\_\_\_\_  
 Beta/Gamma Meter Ser. No. 50482 Calibration date 06 DEC 11



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

21 February 2012

Joan Kessner  
WC-Hanford, Inc.  
2620 Fermi Avenue  
MSIN H4-21  
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 #	1202028
SDG #	K3810
SAF #	RC-111
Date Received	02/08/12
# Samples	1
Matrix	WATER
Volatiles	
Semivolatiles	
Pest/PCB	
Glycols	
DRO/KRO/GRO	
PAHs	
Herbicides	
Metals	
Inorganics	X

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

Olette S. Johnson  
Project Manager

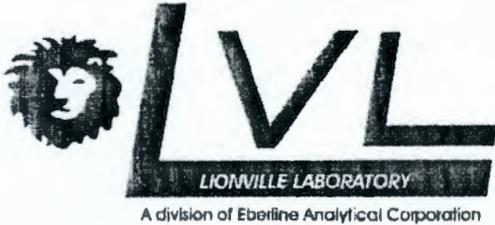


264 Welsh Pool Road  
Exton, PA 19341  
Phone: 610-280-3000  
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-111 Project Number: K3810 Project Manager: Joan Kessner	Reported: 02/20/2012 16:31
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**Analytical Report for Wet Chemistry**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
J1NJP4	1202028-01	Water	02/06/2012 09:10	02/08/2012 10:00



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

### Case Narrative

**Client:** WC-HANFORD RC-111 K3810  
**LVL#:** 1202028

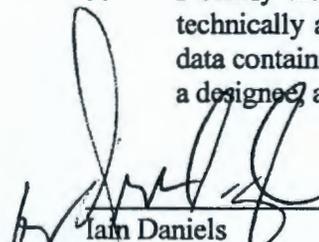
**Date Received:** 02-08-12

### INORGANIC NARRATIVE

1. This narrative covers the analyses of 1 water sample.
2. The sample was prepared and analyzed in accordance with the methods indicated on the data summary report.

Lionville Lab (LvL) is NELAP accredited by the State of Pennsylvania. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager. LvL certifies that all test results meet the requirements of NELAC with any exception noted in the following statements.

3. Sample holding times as required by the method and/or contract were met with the exception of pH that was received past hold.
4. The results presented in this report are derived from a sample that met LvL's sample acceptance policy with the exception noted on the Sample Receipt Checklist.
5. The method blanks were within the method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits and method criteria.
7. The matrix spike recovery for Chloride was within the 80-120% control limits.
8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.
9. 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 package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

  
Iain Daniels  
Laboratory Manager  
Lionville Laboratory

  
Date

njp02-028



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-111  
Project Number: K3810  
Project Manager: Joan Kessner

Reported:  
02/20/2012 16:31

### Notes and Definitions

- U Analyte included in the analysis, but not detected
- B Analyte is found in the associated blank as well as in the sample (CLP B-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
- LOD Limit of Detection (LOD): the minimum estimated concentration of a target analyte that can be detected reliably. Concentrations at the LOD or between the LOD and LOQ are flagged estimated with either a 'J' qualifier or client-specific qualifier.
- LOQ Limit of Quantitation (LOQ): the minimum concentration of a target analyte that can be quantified reliably



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Exton, PA 19341  
Phone: 610-280-3000  
Fax: 610-280-3041

WC-Hanford, Inc. 2620 Fermi Avenue Richland WA, 99354	Project: RC-111 Project Number: K3810 Project Manager: Joan Kessner	Reported: 02/20/2012 16:31
---	---	-------------------------------

**Wet Chemistry  
Lionville Laboratory**

Analyte	Result and Qualifier	LOD	LOQ	Units	Dilution	Batch	Prepared	Analyzed	Method
<b>J1NJP4 (1202028-01) Water</b>									
Specific conductance	2.04 B	0.50	5.00	umhos/cm	1	L202090	02/09/2012	02/09/2012	EPA 120.1 (1982)
Chloride	0.10 U	0.10	0.20	mg/L	1	L202131	02/10/2012	02/10/2012	EPA 300.0 (1993)
pH	5.54	0.05	0.10	pH Units	1	L202148	02/14/2012	02/14/2012	SW846 9040B



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

Project: RC-111  
 Project Number: K3810  
 Project Manager: Joan Kessner

Reported:  
 02/20/2012 16:31

**Wet Chemistry - Quality Control**  
**Lionville Laboratory**

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch L202090 - Default Prep GenChem</b>										
<b>Blank (L202090-BLK1)</b> Prepared & Analyzed: 02/09/2012										
Specific conductance	0.87 B	0.50	5.00	umhos/cm						
<b>Duplicate (L202090-DUP1)</b> Source: 1202028-01 Prepared & Analyzed: 02/09/2012										
Specific conductance	1.88 B	0.50	5.00	umhos/cm		2.04			8	20
<b>Reference (L202090-SRM1)</b> Prepared & Analyzed: 02/09/2012										
Specific conductance	1410	0.50	5.00	umhos/cm	1413.0		100	90-110		
<b>Reference (L202090-SRM2)</b> Prepared & Analyzed: 02/09/2012										
Specific conductance	722	0.50	5.00	umhos/cm	717.80		101	90-110		
<b>Reference (L202090-SRM3)</b> Prepared & Analyzed: 02/09/2012										
Specific conductance	149	0.50	5.00	umhos/cm	147.00		102	90-110		
<b>Batch L202131 - Default Prep GenChem</b>										
<b>Blank (L202131-BLK1)</b> Prepared & Analyzed: 02/10/2012										
Chloride	0.10 U	0.10	0.20	mg/L						
<b>LCS (L202131-BS1)</b> Prepared & Analyzed: 02/10/2012										
Chloride	4.76	0.10	0.20	mg/L	5.0000		95.2	90-110		20
<b>Duplicate (L202131-DUP5)</b> Source: 1202028-01 Prepared & Analyzed: 02/10/2012										
Chloride	0.10 U	0.10	0.20	mg/L		0.10 U				20
<b>Matrix Spike (L202131-MS7)</b> Source: 1202028-01 Prepared & Analyzed: 02/10/2012										
Chloride	4.66	0.10	0.20	mg/L	5.0000	0.10 U	93.2	80-120		20

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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-111 Project Number: K3810 Project Manager: Joan Kessner	Reported: 02/20/2012 16:31
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**Wet Chemistry - Quality Control**  
**Lionville Laboratory**

Analyte	Result and Qualifiers	LOD	LOQ	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch L202148 - Default Prep GenChem</b>										
<b>Duplicate (L202148-DUP1)</b>		<b>Source: 1202028-01</b>			<b>Prepared &amp; Analyzed: 02/14/2012</b>					
pH	5.55	0.05	0.10	pH Units		5.54			0.180	20
<b>Reference (L202148-SRM1)</b>		<b>Prepared &amp; Analyzed: 02/14/2012</b>								
pH	7.04	0.05	0.10	pH Units	7.0000		101	99-101		

Lionville Laboratory Use Only  
 1202028

# Custody Transfer Record/Lab Work Request

Page 1 of 1



FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client <u>W.C. Hayford</u> <u>SAFE# RC-111</u>		Refrigerator #											
Est. Final Proj. Sampling Date		#/Type Container	Liquid										
Project#			Solid										
Project Contact/Phone#		Volume	Liquid										
Lionville Laboratory Project Manager <u>O. Johnson</u>			Solid										
QC <u>SW</u> Del <u>STD</u> TAT <u>15 Days</u>		Preservatives											
Date Rec'd <u>2-8-12</u> Date Due <u>2-23-12</u>		ANALYSES REQUESTED →		ORGANIC					INORG				
				VOA	BNA	Peat/PCB	Herb	Metal	CN	IF Analysis			
Lionville Laboratory Use Only													
<b>MATRIX CODES:</b> W Water WW Waste Water GW Groundwater WST Waste WI Wipe SO Solid S Soil SL Sludge SE Sediment PC Paint Chips O Oil NAL Non-Aqueous Liquid L Leachate A Air T Tissue F Fish	Lab ID	Client ID/Description	Matrix	Date Collected	Time Collected							CL-SPED PH	

Special Instructions:

Special Instructions:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

Relinquished by	Received by	Date	Time
<u>Red Eo</u>	<u>[Signature]</u>	<u>2/8/12</u>	<u>1000</u>

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time

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1202028

<b>Washington Closure Hanford</b>		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>				RC-111-006	Page 1 of 1
Collector <b>Ron Holeman</b>		Company Contact Tom Edmundson		Telephone No. 509.947.5192		Project Coordinator KESSNER, JH	
Project Designation 3730 Building Gamma Irradiation Facility - Semi-Annual Sa		Sampling Location 3730 Gamma Pit		SAF No. RC-111		Price Code <b>7L</b> Data Turnaround <b>15 Days</b>	
Ice Chest No. <b>WCH-11-017</b>		Field Logbook No. EL-1518-25		COA RD4MXX2F00		Method of Shipment Fed Ex	
Shipped To EBERLINE SERVICES <b>(LIONVILLE)</b>		Offsite Property No. <b>A110137</b>		Bill of Lading/Air Bill No. <b>See OSPC sms 2-6-12</b>			
POSSIBLE SAMPLE HAZARDS/REMARKS <i>Potential Rad &lt; DOT Limits RB 2-7-12</i>				Preservation	Cool 4C	HNO3 to pH 2	None
Special Handling and/or Storage <i>Cool 4 degree C</i>				Type of Container	P	P/G	G/P
				No. of Container(s)	1		1
				Volume	1000mL	1000mL	125ml
				See item (1) in Special Instructions.	Gamma Spec - Add-on (Cobalt-60)	RCF GEA Shipping Screen	
SAMPLE ANALYSIS							
Sample No.	Matrix *	Sample Date	Sample Time				
J1NJP4	WATER	2-6-12	0910	✓	✓		
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS	
Relinquished By/Removed From <i>Ron Holeman</i>		Date/Time 2-6-12 0935		Received By/Stored In <i>Tom Edmundson</i>		Date/Time 2-6-12 0935	
Relinquished By/Removed From <i>Tom Edmundson</i>		Date/Time 2-7-12 1240		Received By/Stored In <i>Fedex</i>		Date/Time	
Relinquished By/Removed From <i>Fed Ex</i>		Date/Time 2-8-12 1000		Received By/Stored In <i>VICTOR HERNANDEZ</i>		Date/Time 2-8-12 1000	
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	
LABORATORY SECTION		Received By		Title		Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time	



- Matrix \*
- S=Soil
  - SB=Settlement
  - SO=Solid
  - Sl=Sludge
  - W = Water
  - O=Oil
  - A=Air
  - DS=Dryum Solids
  - DL=Dryum Liquids
  - T=Timon
  - W=Wipe
  - L=Liquid
  - V=Vegetation
  - X=Other

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Lionville Laboratory  
 SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: WC Hanford  
 Project/SAF/SOW/Release #: RC-111

Date: 2/8/12

LvL Batch #: 102 028

Sample Custodian: Pat H

NOTE: EXPLAIN ALL DISCREPANCIES

- |  |  |  |
|--|--|--|
| 1. Samples Hand Delivered or <u>shipped?</u>   | Carrier <u>Fed Ex</u>  | Airbill # <u>7990 3390 0809</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>2.7</u> °C   | Cooler # <u>WCH-11-017</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?<br>All samples received on COC?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br><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 <input type="checkbox"/> No  |  |
| 12. Samples received within hold times?<br>Short holds taken to wet lab?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No<br><input type="checkbox"/> Yes <input type="checkbox"/> No            | <u>PH</u><br><input type="checkbox"/> N/A          |
| 13. VOA, TOC, TOX free of headspace?   | <input type="checkbox"/> Yes <input type="checkbox"/> No   | <input 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<br><u>NO 2/8/12</u>  | <input checked="" type="checkbox"/> See #12        |
| 16. Project Manager contacted concerning any discrepancies?<br>Person Contacted <u>O. Johnson</u>  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No  | <input type="checkbox"/> N/A<br>Date <u>2-8-12</u> |

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