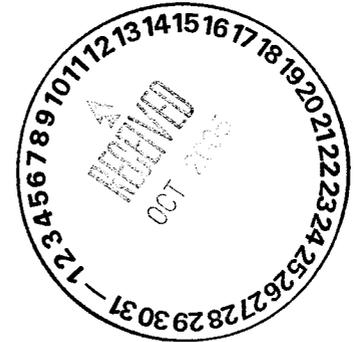






# EBERLINE

SERVICES



October 7, 2005

Ms. Joan Kessner  
Bechtel Hanford Inc.  
3190 George Washington Way  
MSIN H9-02  
Richland, WA 99352

Reference: **P.O. #630**  
**Eberline Services R5-08-231-7300, SDG H3340**

Dear Ms. Kessner:

Enclosed is a data report for one water sample designated under SAF No. B05-039 received at Eberline Services on August 29, 2005. The sample was analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion  
Senior Program Manager

MCM/

Enclosure: Data Package

Analytical Services  
2030 Wright Avenue  
P.O. Box 4040  
Richmond, California 94804-0040  
(510) 235-2633 Fax (510) 235-0438  
Toll Free (800) 841-5487  
[www.eberlineservices.com](http://www.eberlineservices.com)

**1.0 GENERAL**

Bechtel Hanford Inc. (BHI) Sample Delivery Group H3340 was composed of one water sample designated under SAF No. B05-039 with a Project Designation of: ERDF Lysimeter Sampling.

Equal parts (by weight) of sample J03X89 (water) and J03X90 (soil) were thoroughly mixed together for four hours. The slurry was then filtered using 0.45-micron filters and then analyzed for gross alpha/beta and Tc-99. The filtered slurry sample was called J03X89.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-mail on October 5, 2005.

**2.0 ANALYSIS NOTES**

**2.1 Gross Alpha and Gross Beta Analyses**

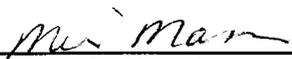
No problems were encountered during the course of the analyses.

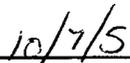
**2.2 Technetium-99 Analyses**

No problems were encountered during the course of the analyses.

**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."**

  
\_\_\_\_\_  
**Melissa C. Mannion**  
**Senior Program Manager**

  
\_\_\_\_\_  
**Date**

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

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

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Melissa Mannion  
Prepared by

Melissa Mannion  
Reviewed by

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H3340

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

Page 1

SUMMARY DATA SECTION

Page 1

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

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 Hanford  
Version Ver 1.0  
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Version 3.06  
Report date 09/28/05

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

SDG 7300  
 Contact Melissa C. Mannion

**LAB SAMPLE SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H3340

LAB SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CHAIN OF CUSTODY	COLLECTED
R508231-01	J03X89	ERDF Add-Mix/Raw Water	WATER		B05-039	B05-039-2	05/25/05 10:45
R508231-02	Lab Control Sample		WATER		B05-039		
R508231-03	Method Blank		WATER		B05-039		
R508231-04	Duplicate (R508231-01)	ERDF Add-Mix/Raw Water	WATER		B05-039		05/25/05 10:45

LAB SUMMARY

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SUMMARY DATA SECTION

Page 3

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LS  
 Version 3.06  
 Report date 09/28/05

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

SDG 7300  
 Contact Melissa C. Mannion

**QC SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H3340

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
7300	B05-039-2	J03X89	WATER		0.98 L		08/29/05 96		R508231-01	7300-001
		Method Blank	WATER						R508231-03	7300-003
		Lab Control Sample	WATER						R508231-02	7300-002
		Duplicate (R508231-01)	WATER		0.98 L		08/29/05 96		R508231-04	7300-004

QC SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-QS  
 Version 3.06  
 Report date 09/28/05

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

SDG 7300  
 Contact Melissa C. Mannion

**PREP BATCH SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H3340

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALIFIERS
			BATCH	2σ %	CLIENT	MORE	RE BLANK	LCS	
Beta Counting									
TC	WATER	Technetium 99 in Water	7136-100	10.0	1		1	1	1/1
Gas Proportional Counting									
93A	WATER	Gross Alpha in Water	7136-100	20.0	1		1	1	1/1
93B	WATER	Gross Beta in Water	7136-100	15.0	1		1	1	1/1

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

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-PBS  
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 Report date 09/28/05

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

SDG 7300  
 Contact Melissa C. Mannion

**LAB WORK SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H3340

LAB SAMPLE	CLIENT SAMPLE ID				SUF-					
COLLECTED	LOCATION	MATRIX			FIX	ANALYZED	REVIEWED	BY	METHOD	
RECEIVED	CUSTODY	SAF No	PLANCHET	TEST						
R508231-01	J03X89		7300-001	93A/93		09/27/05	09/28/05	MWT	Gross Alpha in Water	
05/25/05	ERDF Add-Mix/Raw Water	WATER	7300-001	93B/93		09/27/05	09/28/05	MWT	Gross Beta in Water	
08/29/05	B05-039-2	B05-039	7300-001	TC		09/19/05	09/28/05	MWT	Technetium 99 in Water	
R508231-02	Lab Control Sample		7300-002	93A/93		09/27/05	09/28/05	MWT	Gross Alpha in Water	
		WATER	7300-002	93B/93		09/27/05	09/28/05	MWT	Gross Beta in Water	
		B05-039	7300-002	TC		09/19/05	09/28/05	MWT	Technetium 99 in Water	
R508231-03	Method Blank		7300-003	93A/93		09/27/05	09/28/05	MWT	Gross Alpha in Water	
		WATER	7300-003	93B/93		09/27/05	09/28/05	MWT	Gross Beta in Water	
		B05-039	7300-003	TC		09/19/05	09/28/05	MWT	Technetium 99 in Water	
R508231-04	Duplicate (R508231-01)		7300-004	93A/93		09/27/05	09/28/05	MWT	Gross Alpha in Water	
05/25/05	ERDF Add-Mix/Raw Water	WATER	7300-004	93B/93		09/27/05	09/28/05	MWT	Gross Beta in Water	
08/29/05		B05-039	7300-004	TC		09/20/05	09/28/05	MWT	Technetium 99 in Water	

COUNTS OF TESTS BY SAMPLE TYPE										
TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
93A/93	B05-039	Gross Alpha in Water	900.0_ALPHABETA_GPC	1			1	1	1	4
93B/93	B05-039	Gross Beta in Water	900.0_ALPHABETA_GPC	1			1	1	1	4
TC	B05-039	Technetium 99 in Water	TC99_TR_SEP_LSC	1			1	1	1	4
<b>TOTALS</b>				<b>3</b>			<b>3</b>	<b>3</b>	<b>3</b>	<b>12</b>

WORK SUMMARY

Page 1

SUMMARY DATA SECTION

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Lab id EBRLINE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LWS  
 Version 3.06  
 Report date 09/28/05

**EBERLINE SERVICES / RICHMOND**  
**SAMPLE DELIVERY GROUP H3340**

7300-003

Method Blank

**METHOD BLANK**

SDG <u>7300</u>	Client/Case no <u>Hanford</u>	SDG <u>H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R508231-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7300-003</u>	Material/Matrix <u>WATER</u>	
	SAF No <u>B05-039</u>	

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.163	0.59	1.4	3.0	U	93A
Gross Beta	12587-47-2	0.638	1.1	1.9	4.0	U	93B
Technetium 99	14133-76-7	<u>-1.64</u>	1.4	5.4	15	U	TC

ERDF Lysimeter Sampling

QC-BLANK 54349
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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/05</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

7300-002

Lab Control Sample

**LAB CONTROL SAMPLE**

SDG <u>7300</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> <u>SDG H3340</u> Contract No. <u>630</u>
Lab sample id <u>R508231-02</u> Dept sample id <u>7300-002</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix <u>WATER</u> SAF No <u>B05-039</u>

ANALYTE	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST	ADDED pCi/L	2σ ERR pCi/L	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Gross Alpha	27.1	3.6	1.3	3.0		93A	34.0	1.4	80	71-129	70-130
Gross Beta	35.1	2.6	2.0	4.0		93B	33.1	1.3	106	73-127	80-120
Technetium 99	1070	71	5.9	15		TC	1090	44	98	81-119	80-120

ERDF Lysimeter Sampling

QC-LCS 54348
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LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

Page 8

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>09/28/05</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

7300-004

J03X89

**DUPLICATE**

SDG <u>7300</u> Contact <u>Melissa C. Mannion</u> <b>DUPLICATE</b> Lab sample id <u>R508231-04</u> Dept sample id <u>7300-004</u>	<b>ORIGINAL</b> Lab sample id <u>R508231-01</u> Dept sample id <u>7300-001</u> Received <u>08/29/05</u>	Client/Case no <u>Hanford</u> SDG <u>H3340</u> Contract No. <u>630</u> Client sample id <u>J03X89</u> Location/Matrix <u>ERDF Add-Mix/Raw Water</u> <u>WATER</u> Collected/Volume <u>05/25/05 10:45</u> <u>0.98 L</u> Custody/SAF No <u>B05-039-2</u> <u>B05-039</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	PROT LIMIT
Gross Alpha	0.086	1.3	2.8	3.0	U	93A	2.12	1.6	1.8		184	286	
Gross Beta	5.12	1.4	2.0	4.0		93B	4.87	1.5	2.0		5	69	
Technetium 99	1.45	2.2	4.7	15	U	TC	-0.607	1.4	3.9	U	-		

ERDF Lysimeter Sampling

QC-DUP#1 54350

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-DUP  
 Version 3.06  
 Report date 09/28/05

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

7300-001

J03X89

DATA SHEET

SDG <u>7300</u>	Client/Case no <u>Hanford</u>	SDG <u>H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R508231-01</u>	Client sample id <u>J03X89</u>	
Dept sample id <u>7300-001</u>	Location/Matrix <u>ERDF Add-Mix/Raw Water</u>	<u>WATER</u>
Received <u>08/29/05</u>	Collected/Volume <u>05/25/05 10:45</u>	<u>0.98 L</u>
	Custody/SAF No <u>B05-039-2</u>	<u>B05-039</u>

ANALYTE	CAS NO	RESULT pCi/L	2 $\sigma$ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	2.12	1.6	1.8	3.0		93A
Gross Beta	12587-47-2	4.87	1.5	2.0	4.0		93B
Technetium 99	14133-76-7	-0.607	1.4	3.9	15	U	TC

ERDF Lysimeter Sampling

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/28/05</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

Test TC Matrix WATER  
 SDG 7300  
 Contact Melissa C. Mannion

**LAB METHOD SUMMARY**

TECHNETIUM 99 IN WATER

BETA COUNTING

Client Hanford  
 Contract No. 630  
 Contract SDG H3340

**RESULTS**

LAB	RAW	SUF-		Technetium
SAMPLE ID	TEST FIX	PLANCHET	CLIENT SAMPLE ID	99
Preparation batch 7136-100				
R508231-01		7300-001	J03X89	U
R508231-02		7300-002	LCS (QC ID=54348)	ok
R508231-03		7300-003	BLK (QC ID=54349)	U
R508231-04		7300-004	Duplicate (R508231-01)	- U

Nominal values and limits from method RDLs (pCi/L) 15  
 ERDF Lysimeter Sampling

**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 7136-100			2σ prep error 10.0 %		Reference Lab Notebook 7136 pg. 100								
R508231-01		J03X89	3.9	0.100			95		100			117 09/13/05 09/19	GRB-204
R508231-02		LCS (QC ID=54348)	5.9	0.100			91		50			09/13/05 09/19	GRB-201
R508231-03		BLK (QC ID=54349)	5.4	0.100			95		50			09/13/05 09/19	GRB-202
R508231-04		Duplicate (R508231-01)	4.7	0.100			94		66			118 09/13/05 09/20	GRB-221
		(QC ID=54350)											

Nominal values and limits from method 15 0.100 20-105 50 180

PROCEDURES REFERENCE TC99\_TR\_SEP\_LSC  
 CP-431 Technetium-99 Purification of Soil or Resin by  
 Extraction Chromatography, rev 2  
 CP-008 Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD MDA 5.0 ± 1.7  
 FOR 4 SAMPLES YIELD 94 ± 4

METHOD SUMMARIES

Page 1

SUMMARY DATA SECTION

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Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 09/28/05

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

**LAB METHOD SUMMARY**

GROSS ALPHA IN WATER

GAS PROPORTIONAL COUNTING

Test 93A Matrix WATER  
 SDG 7300  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 630  
 Contract SDG H3340

**RESULTS**

LAB RAW SUF-  
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Gross Alpha

Preparation batch 7136-100

R508231-01	93		7300-001	J03X89	2.12
R508231-02	93		7300-002	LCS (QC ID=54348)	ok
R508231-03	93		7300-003	BLK (QC ID=54349)	U
R508231-04	93		7300-004	Duplicate (R508231-01)	ok U

Nominal values and limits from method RDLs (pCi/L) 3.0  
 ERDF Lysimeter Sampling

**METHOD PERFORMANCE**

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

Preparation batch 7136-100 2σ prep error 20.0 % Reference Lab Notebook 7136 pg. 100

R508231-01	93		J03X89	1.8	<u>0.290</u>	150	100	125	09/27/05	09/27	GRB-216
R508231-02	93		LCS (QC ID=54348)	1.3	0.300	60	100		09/27/05	09/27	GRB-105
R508231-03	93		BLK (QC ID=54349)	1.4	0.300	58	100		09/27/05	09/27	GRB-210
R508231-04	93		Duplicate (R508231-01) (QC ID=54350)	2.8	<u>0.290</u>	150	100	125	09/27/05	09/27	GRB-211

Nominal values and limits from method 3.0 0.300 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 SPP-120 Gross Alpha and Gross Beta in Water, rev 0

AVERAGES ± 2 SD MDA 1.8 ± 1.4  
 FOR 4 SAMPLES RESIDUE 104 ± 105

METHOD SUMMARIES

Page 2

SUMMARY DATA SECTION

Page 12

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 09/28/05

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

**LAB METHOD SUMMARY**

GROSS BETA IN WATER

GAS PROPORTIONAL COUNTING

Test 93B Matrix WATER  
 SDG 7300  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 630  
 Contract SDG H3340

**RESULTS**

LAB RAW SUF-  
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Gross Beta

Preparation batch 7136-100

R508231-01	93	7300-001	J03X89	4.87
R508231-02	93	7300-002	LCS (QC ID=54348)	ok
R508231-03	93	7300-003	BLK (QC ID=54349)	U
R508231-04	93	7300-004	Duplicate (R508231-01)	ok

Nominal values and limits from method RDLs (pCi/L) 4.0  
 ERDF Lysimeter Sampling

**METHOD PERFORMANCE**

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

Preparation batch 7136-100 2σ prep error 15.0 % Reference Lab Notebook 7136 pg. 100

R508231-01	93	J03X89	2.0	<u>0.290</u>	150	100	125	09/27/05	09/27	GRB-216
R508231-02	93	LCS (QC ID=54348)	2.0	0.300	60	100		09/27/05	09/27	GRB-105
R508231-03	93	BLK (QC ID=54349)	1.9	0.300	58	100		09/27/05	09/27	GRB-210
R508231-04	93	Duplicate (R508231-01) (QC ID=54350)	2.0	<u>0.290</u>	150	100	125	09/27/05	09/27	GRB-211

Nominal values and limits from method 4.0 0.300 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
 SPP-120 Gross Alpha and Gross Beta in Water, rev 0

AVERAGES ± 2 SD MDA 2.0 ± 0.10  
 FOR 4 SAMPLES RESIDUE 104 ± 105

METHOD SUMMARIES

Page 3

SUMMARY DATA SECTION

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Lab id EBRLNE  
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 Version 3.06  
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

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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Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
Report date 09/28/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7300  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

PREPARATION BATCH SUMMARY

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

The following notes apply to this report:

- \* The preparation batches are shown in the same order as the Method Summary Reports are printed.
- \* Only analyses of planchets relevant to the SDG are included.
- \* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.
- \* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

These qualifiers should be reviewed as follows:

- X Some data has been manually entered or modified. Transcription errors are possible.
- P One or more results are 'preliminary'. The data is not ready for final reporting.
- 2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

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

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WORK SUMMARY

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

The following notes apply to this report:

- \* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- \* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- \* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- \* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- \* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- \* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

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

The following notes apply to this report:

- \* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- \* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

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

- \* ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- \* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- \* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

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

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DATA SHEET

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

- J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.
  - B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.
- Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.
- For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.
- L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.
  - H Similar to 'L' except the recovery was high.
  - P The RESULT is 'preliminary'.
  - X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.
  - 2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

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

The following values are underlined to indicate possible problems:

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

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DATA SHEET

- \* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- \* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- \* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

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

The following notes apply to this report:

- \* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- \* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

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

- \* REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  1. The error of RESULT, including that introduced by rounding the result prior to printing.
 

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
  2. The error of ADDED.
  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- \* The second limits are protocol defined upper and lower QC limits for the recovery.
- \* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

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

1. A fixed percentage specified in the protocol.

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DUPLICATE

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

- \* The RPD is underlined if it is greater than either limit.
- \* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

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

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

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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

- \* The first, computed limits for the recovery reflect:

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

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

2. The error of ADDED.

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

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

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MATRIX SPIKE

for the recovery.

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

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

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 Contact Melissa C. Mannion

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**METHOD SUMMARY**

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

The following notes apply to this report:

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

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

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

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

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

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

- \* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- \* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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METHOD SUMMARY

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

- \* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.
- \* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

MDAs are underlined if greater than the printed RDL.

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

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METHOD SUMMARY

- \* Count times are underlined if less than the nominal value specified for the method.
- \* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- \* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- \* Days Held are underlined if greater than the holding time specified in the protocol.
- \* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

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

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

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

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

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

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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.

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"Weiss, Richard L"  
<richard.weiss@wch-rcc.com>  
>

09/01/2005 07:30 AM

To "mmannion@eberlineservices.com"  
<mmannion@eberlineservices.com>  
cc "Kessner, Joan H" <joan.kessner@wch-rcc.com>  
bcc

Subject "Mud Pie" Sample

History:  This message has been forwarded.

Melissa,

This applies to samples J03X89 and J03X90 on SAF B05-039.

I did get information from the project, but we cannot match the true "field" conditions. The field specification is for 20% moisture and that would not yield any usable liquid for testing.

So, the following is based on the typical protocols for determining things like pH and soluble ions in soil samples.

Perform the contact using a 1:1 liquid/solid ratio based on weight. If you can get this mixture to stir using a beaker and stir-bar, do that for 1 hour. If the beaker method doesn't work, mix the liquid and solid in a jar, shake and continue shaking to thoroughly a couple times an hour for 4 hours. Then separate the liquid from the solid (any process is acceptable) and analyze the liquid. Use sample number J03X89 for the analysis results. Please remember that you need to ship a least 100ml off to Lionville for chloride analysis.

If any of this doesn't make sense, let me know.

Rich Weiss  
509-372-9631

Also, did you need my input on something else?

Company Contact: KESSNER, JH Telephone No. 375-4688  
 Project Coordinator: *M. J. KESSNER, JH*  
 Sampling Location: ERDF ADD-MIX/RAW WATER **H3340 (729A)** SAF No. B05-039  
 Field Logbook No. EL-1518-2 COA RERDF22560  
 Offsite Property No. **A05040Z** Method of Shipment: FED EX  
 Bill of Lading/Air Bill No. SEE OSPC

Preservation	None	None	None
Type of Container	G/P	P	
No. of Container(s)	1	1	
Volume	500ml	500ml	
	Gross Alpha, IC Anions - 300.0 (Chloride)		
	Gross Beta, Technetium-99		

**SAMPLE ANALYSIS**

Sample No.	Matrix *	Sample Date	Sample Time	Date/Time
J03X89	WATER	8-25-05	1045	X1 - 08/25/05
J03X90	Solid	8-25-05	1050	X2

**CHAIN OF POSSESSION**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
<i>Stacy...</i>	08/26/05	FED EX	08/26/05 9:20
<i>FED EX</i>	08/26/05	<i>FEU</i>	08/26/05 9:20

**SPECIAL INSTRUCTIONS CONTACT JOAN KESSNER UPON RECEIPT.**  
 X1 = 5 GALLONS IN CUBITAINER  
 X2 = 3 LITERS IN POLY BAG  
 NOTE: UPON COMPLETION OF ANALYSIS TRANSFER TO APPROPRIATE FOR FURTHER ANALYSIS.

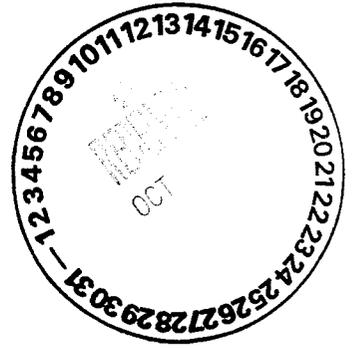
**Matrix \***  
 S=Soil, SP=Sludges, SO=Solid, SI=Sludge, W=Water, O=Oil, A=Air, DS=Dry Solids, DL=Dry Liquids, T=Tissue, WI=Wipe, L=Liquid, V=Vegetation, X=Other





# EBERLINE

SERVICES



October 7, 2005

Ms. Joan Kessner  
Bechtel Hanford Inc.  
3190 George Washington Way  
MSIN H9-02  
Richland, WA 99352

Reference: **P.O. #630**  
**Eberline Services R5-08-192-7298, SDG H3340**

Dear Ms. Kessner:

Enclosed is a data report for four water samples designated under SAF No. B05-039 received at Eberline Services on August 25, 2005. The samples were analyzed according to the accompanying chain-of-custody documents.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion  
Senior Program Manager

MCM/njv

Enclosure: Data Package

Analytical Services  
2030 Wright Avenue  
P.O. Box 4040  
Richmond, California 94804-0040  
(510) 235-2633 Fax (510) 235-0438  
Toll Free (800) 841-5487  
[www.eberlineservices.com](http://www.eberlineservices.com)

**1.0 GENERAL**

Bechtel Hanford Inc. (BHI) Sample Delivery Group H3340 was composed of four water samples designated under SAF No. B05-039 with a Project Designation of: ERDF Lysimeter Sampling.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-mail on September 29, 2005.

**2.0 ANALYSIS NOTES**

**2.1 Gross Alpha and Gross Beta Analyses**

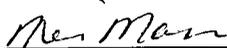
No problems were encountered during the course of the analyses.

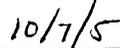
**2.2 Technetium-99 Analyses**

No problems were encountered during the course of the analyses.

**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."**

  
\_\_\_\_\_  
**Melissa C. Mannion**  
**Senior Program Manager**

  
\_\_\_\_\_  
**Date**

EBRLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
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S U M M A R Y   D A T A   S E C T I O N

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Melissa Mannion  
Prepared by

Melissa Mannion  
Reviewed by

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-TOC  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG H3340

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

Page 1

SUMMARY DATA SECTION

Page 1

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
Version 3.06  
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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford  
Contract No. 630  
Case no SDG H3340

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

Page 2

SUMMARY DATA SECTION

Page 2

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-RG  
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Report date 09/29/05

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

**LAB SAMPLE SUMMARY**

SDG 7298  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 630  
 Case no SDG H3340

LAB						CHAIN OF	
SAMPLE ID	CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	SAF NO	CUSTODY	COLLECTED
R508192-01	J03X48	ERDF Cells 5&6	WATER		B05-039	B05-039-1	08/24/05 08:30
R508192-02	J03X49	ERDF Cells 5&6	WATER		B05-039	B05-039-1	08/24/05 08:40
R508192-03	J03X50	ERDF Cells 5&6	WATER		B05-039	B05-039-1	08/24/05 10:45
R508192-04	J03X51	ERDF Cells 5&6	WATER		B05-039	B05-039-1	08/24/05 10:55
R508192-05	Lab Control Sample		WATER		B05-039		
R508192-06	Method Blank		WATER		B05-039		
R508192-07	Duplicate (R508192-01)	ERDF Cells 5&6	WATER		B05-039		08/24/05 08:30

LAB SUMMARY

Page 1

SUMMARY DATA SECTION

Page 3

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LS  
 Version 3.06  
 Report date 09/29/05

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

SDG 7298  
 Contact Melissa C. Mannion

**QC SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H3340

QC BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
7298	B05-039-1	J03X48	WATER		2.0 L		08/25/05	1	R508192-01	7298-001
		J03X49	WATER		1.1 L		08/25/05	1	R508192-02	7298-002
		J03X50	WATER		2.0 L		08/25/05	1	R508192-03	7298-003
		J03X51	WATER		1.3 L		08/25/05	1	R508192-04	7298-004
		Method Blank	WATER						R508192-06	7298-006
		Lab Control Sample	WATER						R508192-05	7298-005
		Duplicate (R508192-01)	WATER		2.0 L		08/25/05	1	R508192-07	7298-007

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-QS  
 Version 3.06  
 Report date 09/29/05

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

SDG 7298  
 Contact Melissa C. Mannion

**PREP BATCH SUMMARY**

Client Hanford  
 Contract No. 630  
 Case no SDG H3340

TEST	MATRIX	METHOD	PREPARATION ERROR		PLANCHETS ANALYZED				QUALI-	
			BATCH	2σ %	CLIENT	MORE	RE	BLANK		LCS
Beta Counting										
TC	WATER	Technetium 99 in Water	7136-098	10.0	4			1	1	1/1
Gas Proportional Counting										
93A	WATER	Gross Alpha in Water	7136-098	20.0	4			1	1	1/1
93B	WATER	Gross Beta in Water	7136-098	15.0	4			1	1	1/1

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

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-PBS  
 Version 3.06  
 Report date 09/29/05

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

**LAB WORK SUMMARY**

SDG 7298  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Case no SDG H3340

LAB SAMPLE COLLECTED RECEIVED	CLIENT SAMPLE ID LOCATION CUSTODY	SAF No	MATRIX	PLANCHET	TEST	SUF- FIX	ANALYZED	REVIEWED	BY	METHOD
R508192-01 08/24/05 08/25/05	J03X48 ERDF Cells 5&6 B05-039-1	B05-039		7298-001 7298-001 7298-001	93A/93 93B/93 TC		09/27/05 09/27/05 09/13/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-02 08/24/05 08/25/05	J03X49 ERDF Cells 5&6 B05-039-1	B05-039		7298-002 7298-002 7298-002	93A/93 93B/93 TC		09/27/05 09/27/05 09/13/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-03 08/24/05 08/25/05	J03X50 ERDF Cells 5&6 B05-039-1	B05-039		7298-003 7298-003 7298-003	93A/93 93B/93 TC		09/27/05 09/27/05 09/13/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-04 08/24/05 08/25/05	J03X51 ERDF Cells 5&6 B05-039-1	B05-039		7298-004 7298-004 7298-004	93A/93 93B/93 TC		09/27/05 09/27/05 09/12/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-05 08/24/05 08/25/05	Lab Control Sample ERDF Cells 5&6 B05-039-1	B05-039		7298-005 7298-005 7298-005	93A/93 93B/93 TC		09/28/05 09/28/05 09/12/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-06 08/24/05 08/25/05	Method Blank ERDF Cells 5&6 B05-039-1	B05-039		7298-006 7298-006 7298-006	93A/93 93B/93 TC		09/27/05 09/27/05 09/13/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water
R508192-07 08/24/05 08/25/05	Duplicate (R508192-01) ERDF Cells 5&6 B05-039-1	B05-039		7298-007 7298-007 7298-007	93A/93 93B/93 TC		09/27/05 09/27/05 09/13/05	09/29/05 09/29/05 09/29/05	MWT MWT MWT	Gross Alpha in Water Gross Beta in Water Technetium 99 in Water

**COUNTS OF TESTS BY SAMPLE TYPE**

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP	SPIKE	TOTAL
93A/93	B05-039	Gross Alpha in Water	900.0_ALPHABETA_GPC	4			1	1	1		7
93B/93	B05-039	Gross Beta in Water	900.0_ALPHABETA_GPC	4			1	1	1		7
TC	B05-039	Technetium 99 in Water	TC99_TR_SEP_LSC	4			1	1	1		7
<b>TOTALS</b>				<b>12</b>			<b>3</b>	<b>3</b>	<b>3</b>		<b>21</b>

WORK SUMMARY

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SUMMARY DATA SECTION

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Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LWS  
Version 3.06  
Report date 09/29/05

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

7298-006

Method Blank

METHOD BLANK

SDG <u>7298</u>	Client/Case no <u>Hanford</u>	<u>SDG H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R508192-06</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7298-006</u>	Material/Matrix _____	<u>WATER</u>
	SAF No <u>B05-039</u>	

ANALYTE	CAS NO	RESULT pCi/L	2 $\sigma$ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.502	0.80	1.4	3.0	U	93A
Gross Beta	12587-47-2	0.045	1.1	1.9	4.0	U	93B
Technetium 99	14133-76-7	0.090	1.6	5.5	15	U	TC

ERDF Lysmeter Sampling

QC-BLANK 54234
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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>



**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

7298-007

J03X48

**DUPLICATE**

SDG <u>7298</u> Contact <u>Melissa C. Mannion</u> DUPLICATE Lab sample id <u>R508192-07</u> Dept sample id <u>7298-007</u>	ORIGINAL Lab sample id <u>R508192-01</u> Dept sample id <u>7298-001</u> Received <u>08/25/05</u>	Client/Case no <u>Hanford</u> <u>SDG H3340</u> Contract No. <u>630</u> Client sample id <u>J03X48</u> Location/Matrix <u>ERDF Cells 5&amp;6</u> <u>WATER</u> Collected/Volume <u>08/24/05 08:30</u> <u>2.0 L</u> Custody/SAF No <u>B05-039-1</u> <u>B05-039</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	PROT LIMIT
Gross Alpha	-0.121	2.1	<u>4.4</u>	3.0	U	93A	0.361	2.1	<u>3.8</u>	U	-		
Gross Beta	14.2	2.0	2.3	4.0		93B	16.9	2.3	2.5		17	43	
Technetium 99	-0.588	1.6	5.5	15	U	TC	-0.617	1.4	3.8	U	-		

ERDF Lysmeter Sampling

QC-DUP#1 54235

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

7298-001

J03X48

DATA SHEET

SDG <u>7298</u>	Client/Case no <u>Hanford</u>	SDG <u>H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R508192-01</u>	Client sample id <u>J03X48</u>	
Dept sample id <u>7298-001</u>	Location/Matrix <u>ERDF Cells 5&amp;6</u>	<u>WATER</u>
Received <u>08/25/05</u>	Collected/Volume <u>08/24/05 08:30</u>	<u>2.0 L</u>
	Custody/SAF No <u>B05-039-1</u>	<u>B05-039</u>

ANALYTE	CAS NO	RESULT pCi/L	2 $\sigma$ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.361	2.1	<u>3.8</u>	3.0	U	93A
Gross Beta	12587-47-2	16.9	2.3	2.5	4.0		93B
Technetium 99	14133-76-7	-0.617	1.4	3.8	15	U	TC

ERDF Lysmeter Sampling

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>

DATA SHEETS

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EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

7298-002

J03X49

DATA SHEET

SDG <u>7298</u>	Client/Case no <u>Hanford</u>	<u>SDG H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract <u>No. 630</u>	
Lab sample id <u>R508192-02</u>	Client sample id <u>J03X49</u>	
Dept sample id <u>7298-002</u>	Location/Matrix <u>ERDF Cells 5&amp;6</u>	<u>WATER</u>
Received <u>08/25/05</u>	Collected/Volume <u>08/24/05 08:40</u>	<u>1.1 L</u>
	Custody/SAF No <u>B05-039-1</u>	<u>B05-039</u>

ANALYTE	CAS NO	RESULT pCi/L	2 $\sigma$ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.908	1.5	<u>3.5</u>	3.0	U	93A
Gross Beta	12587-47-2	16.1	2.4	2.7	4.0		93B
Technetium 99	14133-76-7	<u>-3.33</u>	2.1	6.5	15	U	TC

ERDF Lysmeter Sampling

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>

EBERLINE SERVICES / RICHMOND  
SAMPLE DELIVERY GROUP H3340

7298-003

J03X50

DATA SHEET

SDG <u>7298</u>	Client/Case no <u>Hanford</u>	SDG <u>H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R508192-03</u>	Client sample id <u>J03X50</u>	
Dept sample id <u>7298-003</u>	Location/Matrix <u>ERDF Cells 5&amp;6</u>	<u>WATER</u>
Received <u>08/25/05</u>	Collected/Volume <u>08/24/05 10:45</u>	<u>2.0 L</u>
	Custody/SAF No <u>B05-039-1</u>	<u>B05-039</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	0.262	2.2	<u>4.1</u>	3.0	U	93A
Gross Beta	12587-47-2	15.4	2.4	2.8	4.0		93B
Technetium 99	14133-76-7	0.230	1.6	3.8	15	U	TC

ERDF Lysmeter Sampling

DATA SHEETS

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3340

7298-004

J03X51

DATA SHEET

SDG <u>7298</u>	Client/Case no <u>Hanford</u>	SDG <u>H3340</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R508192-04</u>	Client sample id <u>J03X51</u>	
Dept sample id <u>7298-004</u>	Location/Matrix <u>ERDF Cells 5&amp;6</u>	<u>WATER</u>
Received <u>08/25/05</u>	Collected/Volume <u>08/24/05 10:55</u>	<u>1.3 L</u>
	Custody/SAF No <u>B05-039-1</u>	<u>B05-039</u>

ANALYTE	CAS NO	RESULT pCi/L	2σ ERR (COUNT)	MDA pCi/L	RDL pCi/L	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.345	1.7	<u>3.6</u>	3.0	U	93A
Gross Beta	12587-47-2	15.2	2.4	2.7	4.0		93B
Technetium 99	14133-76-7	-0.629	1.6	5.6	15	U	TC

ERDF Lysmeter Sampling

DATA SHEETS

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SUMMARY DATA SECTION

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Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/29/05</u>

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

**LAB METHOD SUMMARY**

TECHNETIUM 99 IN WATER

BETA COUNTING

Test TC Matrix WATER  
 SDG 7298  
 Contact Melissa C. Mannion

Client Hanford  
 Contract No. 630  
 Contract SDG H3340

**RESULTS**

LAB RAW SUP- Technetium  
 SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID 99

Preparation batch 7136-098

R508192-01	7298-001	J03X48	U
R508192-02	7298-002	J03X49	U
R508192-03	7298-003	J03X50	U
R508192-04	7298-004	J03X51	U
R508192-05	7298-005	LCS (QC ID=54233)	ok
R508192-06	7298-006	BLK (QC ID=54234)	U
R508192-07	7298-007	Duplicate (R508192-01)	- U

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

ERDF Lysmeter Sampling

**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 7136-098 2σ prep error 10.0 % Reference Lab Notebook 7136 pg. 098

R508192-01	J03X48	3.8	0.100	93	100	20	09/08/05	09/13	GRB-218
R508192-02	J03X49	6.5	0.100	60	100	20	09/08/05	09/13	GRB-219
R508192-03	J03X50	3.8	0.100	92	100	20	09/08/05	09/13	GRB-220
R508192-04	J03X51	5.6	0.100	91	50	19	09/08/05	09/12	GRB-220
R508192-05	LCS (QC ID=54233)	5.6	0.100	92	50		09/08/05	09/12	GRB-221
R508192-06	BLK (QC ID=54234)	5.5	0.100	91	50		09/08/05	09/13	GRB-222
R508192-07	Duplicate (R508192-01) (QC ID=54235)	5.5	0.100	92	50	20	09/08/05	09/13	GRB-223

Nominal values and limits from method 15 0.100 20-105 50 180

PROCEDURES REFERENCE TC99\_TR\_SEP\_LSC  
 CP-431 Technetium-99 Purification of Soil or Resin by  
 Extraction Chromatography, rev 2  
 CP-008 Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD MDA 5.2 ± 2.0  
 FOR 7 SAMPLES YIELD 87 ± 24

Lab id EBRLNE  
 Protocol Hanford  
 Version Ver 1.0  
 Form DVD-LMS  
 Version 3.06  
 Report date 09/29/05

METHOD SUMMARIES

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SUMMARY DATA SECTION

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**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

**LAB METHOD SUMMARY**

GROSS ALPHA IN WATER  
GAS PROPORTIONAL COUNTING

Test 93A Matrix WATER  
SDG 7298  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Contract SDG H3340

**RESULTS**

LAB	RAW	SUF-			Gross Alpha
SAMPLE ID	TEST FIX	PLANCHET	CLIENT	SAMPLE ID	
Preparation batch 7136-098					
R508192-01	93	7298-001	J03X48		U
R508192-02	93	7298-002	J03X49		U
R508192-03	93	7298-003	J03X50		U
R508192-04	93	7298-004	J03X51		U
R508192-05	93	7298-005	LCS (QC ID=54233)		<u>LOW</u>
R508192-06	93	7298-006	BLK (QC ID=54234)		U
R508192-07	93	7298-007	Duplicate (R508192-01)		- U

Nominal values and limits from method RDLs (pCi/L) 3.0

ERDF Lysmeter Sampling

**METHOD PERFORMANCE**

LAB	RAW	SUF-	MDA	ALIQ	PREP	DILU-	RESID	EFF	COUNT	FWHM	DRIFT	DAYS	ANAL-		
SAMPLE ID	TEST FIX	CLIENT	pCi/L	L	FAC	TION	mg	%	min	keV	KeV	HELD	PREPARED	YZED	DETECTOR
Preparation batch 7136-098 2σ prep error 20.0 % Reference Lab Notebook 7136 pg. 098															
R508192-01	93	J03X48	<u>3.8</u>	<u>0.275</u>			240		100			34	09/27/05	09/27	GRB-105
R508192-02	93	J03X49	<u>3.5</u>	<u>0.225</u>			177		100			34	09/27/05	09/27	GRB-109
R508192-03	93	J03X50	<u>4.1</u>	<u>0.260</u>			230		100			34	09/27/05	09/27	GRB-110
R508192-04	93	J03X51	<u>3.6</u>	<u>0.225</u>			201		100			34	09/27/05	09/27	GRB-111
R508192-05	93	LCS (QC ID=54233)	1.4	0.300			59		100				09/27/05	09/28	GRB-105
R508192-06	93	BLK (QC ID=54234)	1.4	0.300			59		100				09/27/05	09/27	GRB-210
R508192-07	93	Duplicate (R508192-01)	<u>4.4</u>	<u>0.275</u>			238		100			34	09/27/05	09/27	GRB-211
(QC ID=54235)															

Nominal values and limits from method 3.0 0.300 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
SPP-120 Gross Alpha and Gross Beta in Water, rev 0

AVERAGES ± 2 SD MDA 3.2 ± 2.5  
FOR 7 SAMPLES RESIDUE 172 ± 161

Lab id EBRLNE  
Protocol Hanford  
Version Ver 1.0  
Form DVD-LMS  
Version 3.06  
Report date 09/29/05

**EBERLINE SERVICES/RICHMOND**

SAMPLE DELIVERY GROUP H3340

**LAB METHOD SUMMARY**

GROSS BETA IN WATER  
GAS PROPORTIONAL COUNTING

Test 93E Matrix WATER  
SDG 7298  
Contact Melissa C. Mannion

Client Hanford  
Contract No. 630  
Contract SDG H3340

**RESULTS**

LAB RAW SUF-  
SAMPLE ID TEST FIX PLANCHET CLIENT SAMPLE ID Gross Beta

Preparation batch 7136-098

R508192-01	93	7298-001	J03X48	16.9
R508192-02	93	7298-002	J03X49	16.1
R508192-03	93	7298-003	J03X50	15.4
R508192-04	93	7298-004	J03X51	15.2
R508192-05	93	7298-005	LCS (QC ID=54233)	ok
R508192-06	93	7298-006	BLK (QC ID=54234)	U
R508192-07	93	7298-007	Duplicate (R508192-01)	ok

Nominal values and limits from method RDLs (pCi/L) 4.0  
ERDF Lysmeter Sampling

**METHOD PERFORMANCE**

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

Preparation batch 7136-098 2σ prep error 15.0 % Reference Lab Notebook 7136 pg. 098

R508192-01	93	J03X48	2.5	<u>0.275</u>	240	100	34	09/27/05	09/27	GRB-105
R508192-02	93	J03X49	2.7	<u>0.225</u>	177	100	34	09/27/05	09/27	GRB-109
R508192-03	93	J03X50	2.8	<u>0.260</u>	230	100	34	09/27/05	09/27	GRB-110
R508192-04	93	J03X51	2.7	<u>0.225</u>	201	100	34	09/27/05	09/27	GRB-111
R508192-05	93	LCS (QC ID=54233)	2.0	0.300	59	100		09/27/05	09/28	GRB-105
R508192-06	93	BLK (QC ID=54234)	1.9	0.300	59	100		09/27/05	09/27	GRB-210
R508192-07	93	Duplicate (R508192-01) (QC ID=54235)	2.3	<u>0.275</u>	238	100	34	09/27/05	09/27	GRB-211

Nominal values and limits from method 4.0 0.300 5-250 100 180

PROCEDURES REFERENCE 900.0\_ALPHABETA\_GPC  
SPP-120 Gross Alpha and Gross Beta in Water, rev 0

AVERAGES ± 2 SD MDA 2.4 ± 0.72  
FOR 7 SAMPLES RESIDUE 172 ± 161

METHOD SUMMARIES

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SDG 7298  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

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 H3340

SDG 7298  
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford  
Contract No. 630  
Case no SDG\_H3340

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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SAMPLE DELIVERY GROUP H3340

SDG 7298  
Contact Melissa C. Mannion

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Client Hanford  
Contract No. 630  
Case no SDG H3340

WORK SUMMARY

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

The following notes apply to this report:

- \* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.
- \* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.
- \* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.
- \* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.
- \* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.
- \* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

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

The following notes apply to this report:

- \* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.
- \* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

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

- \* ERRORS can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.
- \* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.
- \* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

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

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GUIDE, cont.

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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- \* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.
- \* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.
- \* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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LAB CONTROL SAMPLE

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

The following notes apply to this report:

- \* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.
- \* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

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

- \* REC (Recovery) is RESULT divided by ADDED expressed as a percent.
- \* The first, computed limits for the recovery reflect:
  1. The error of RESULT, including that introduced by rounding the result prior to printing.
 

If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.
  2. The error of ADDED.
  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.
- \* The second limits are protocol defined upper and lower QC limits for the recovery.
- \* The recovery is underlined if it is outside either of these ranges.

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DUPLICATE

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

The following notes apply to this report:

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

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

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

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

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

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

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

This value reported for this limit is at most 999.

- \* The second limit for the RPD is the larger of:
  1. A fixed percentage specified in the protocol.

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DUPLICATE

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

- \* The RPD is underlined if it is greater than either limit.
- \* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

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

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

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MATRIX SPIKE

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

The following notes apply to this report:

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

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

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

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

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

- \* The first, computed limits for the recovery reflect:

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

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

2. The error of ADDED.

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

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

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MATRIX SPIKE

for the recovery.

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

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

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METHOD SUMMARY

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

The following notes apply to this report:

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

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

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

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

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

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

- \* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.
- \* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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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.

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METHOD SUMMARY

- \* Count times are underlined if less than the nominal value specified for the method.
- \* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.
- \* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.
- \* Days Held are underlined if greater than the holding time specified in the protocol.
- \* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

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

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

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

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

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

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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.

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**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

<b>Bechtel Hanford Inc.</b>	<b>Company Contact</b> KESSNER, JH	<b>Telephone No.</b> 375-4688	<b>Project Coordinator</b> KESSNER, JH
<b>Inspector</b> S.J. GALE	<b>Sampling Location</b> ERDF CELLS 5&6	<b>Field Logbook No.</b> EL-1518-2	<b>SAF No.</b> B05-039
<b>Object Designation</b> ERDF Lysimeter Sampling	<b>COA</b> RERDF22560	<b>Method of Shipment</b> FED EX	<b>Price Code</b> B05-039-1
<b>Site No.</b> CFC 01 030	<b>Offsite Property No.</b> A050310	<b>Bill of Lading/Air Bill No.</b> SEE OSCP	<b>Data Turnaround</b> 45 Days
<b>Shipping To</b> BERLINE SERVICES LIONVILLE			
<b>POSSIBLE SAMPLE HAZARDS/REMARKS</b> ICIDIC			
<b>Special Handling and/or Storage</b> NONE			

Sample No.	Matrix *	Sample Date	Sample Time	Preservation		Volume	IC Anions - 300.0 (Chloride)	Cool 4C	HNO3 to pH <2	G/P
				Type of Container	No. of Container(s)					
J03X48	WATER	8-24-05	0830		2	1000mL				
J03X40	WATER									
J03X50	WATER									
J03X51	WATER									

CHAIN OF POSSESSION		Sign/Print Names		Date/Time
Relinquished By/Removed From	<i>S. GALE</i>	Received By/Stored In	<i>FED EX</i>	
Relinquished By/Removed From	<i>8/24/05</i>	Received By/Stored In	<i>RFM</i>	08/25/05 9:70
Relinquished By/Removed From	<i>FED EX</i>	Received By/Stored In		
Relinquished By/Removed From		Received By/Stored In		
Relinquished By/Removed From		Received By/Stored In		
Relinquished By/Removed From		Received By/Stored In		

**SPECIAL INSTRUCTIONS**

Title

Disposed By

Collector: SJ, GALE  
 Project Designation: ERDF Lysimeter Sampling  
 Ice Chest No.: **ERC 01030**  
 Shipped To: **EBERLINE SERVICES/ LIONVILLE**  
 POSSIBLE SAMPLE HAZARDS/REMARKS: **ACIDIC NONE 4/0 82305**  
 Special Handling and/or Storage: **NONE**

Company Contact: KESSNER, JH Telephone No.: 375-4688  
 Project Coordinator: KESSNER, JH  
 Project No.: B05-039  
 Method of Shipment: FED EX  
 Bill of Lading/Air Bill No.: SEE OSPC

Company Contact: KESSNER, JH Telephone No.: 375-4688  
 Project Coordinator: KESSNER, JH  
 Project No.: B05-039  
 Method of Shipment: FED EX  
 Bill of Lading/Air Bill No.: SEE OSPC

Company Contact: KESSNER, JH Telephone No.: 375-4688  
 Project Coordinator: KESSNER, JH  
 Project No.: B05-039  
 Method of Shipment: FED EX  
 Bill of Lading/Air Bill No.: SEE OSPC

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	Gross Alpha, Gross Beta, Technetium-99	IC Antions - 300.0 (Chloride)
J03X48	WATER	8-24-05	0840	None	G/P	2	1000mL		
J03X49	WATER								
J03X50	WATER								
J03X51	WATER								

CHAIN OF POSSESSION		Sign/Print Names	Date/Time
Relinquished By/Removed From	<i>[Signature]</i>	Received By/Stored In	FED EX
Relinquished By/Removed From	<i>[Signature]</i>	Received By/Stored In	PTM 08/25/05 9:30
Relinquished By/Removed From	<i>[Signature]</i>	Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	
Relinquished By/Removed From		Received By/Stored In	

LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION			

## CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

**Collector:** SJ, GALE **Price Code:** B05-039-1  
**Project Designation:** ERDF Lysimeter Sampling **Data Turnaround:** 45 Days  
**Project Coordinator:** KESSNER, JH  
**SAF No.:** B05-039 **Air Quality:**   
**Method of Shipment:** FED EX  
**Field Logbook No.:** EL-1518-2 **Bill of Lading/Air Bill No.:** SEE OSPC  
**Offsite Property No.:** A050 310

**Company Contact:** KESSNER, JH **Telephone No.:** 375-4688  
**Sampling Location:** ERDF CELLS 5&6 **COA:** RERDF22560  
**Field Logbook No.:** EL-1518-2 **Offsite Property No.:** A050 310  
**Shipped To:** (EBERLINE SERVICES) LIONVILLE

**Ice Chest No.:** 01030  
**POSSIBLE SAMPLE HAZARDS/REMARKS:** ACIDIC

**Special Handling and/or Storage:** NONE

SAMPLE ANALYSIS	
Sample No.	Matrix *
J03X48	WATER
J03X49	WATER
J03X50	WATER
J03X51	WATER

Preservation	HNO3 to pH <2	Cool 4C
G/P		P
Type of Container		
No. of Container(s)	2	1
Volume	1000mL	500mL

Gross Alpha; Gross Beta; Technetium-99	IC Anions - 300 0 (Chloride)

Sign/Print Names	Date/Time
Received By/Stored In	

Date/Time	Date/Time	Date/Time

**LABORATORY SECTION:** Received By \_\_\_\_\_ Title \_\_\_\_\_  
**FINAL SAMPLE DISPOSITION:** Disposal Method \_\_\_\_\_ Disposed By \_\_\_\_\_ Date/Time \_\_\_\_\_

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

BHI-EE-011 (03/01/2002)

**Bechtel Hanford Inc.** Page 1 of 1  
**B05-039-1**  
 Price Code  
 Data Turnaround  
**45 Days**

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**  
 Project Coordinator  
 KESSNER, JH  
 SAF No.  
 B05-039  
 Method of Shipment  
 FED EX  
 Bill of Lading/Air Bill No.  
 SEE OSPC

Company Contact  
 KESSNER, JH  
 Telephone No.  
 375-4688  
 Sampling Location  
 ERDF CELLS 5&6  
 H 3340 (7298)  
 Field Logbook No.  
 EL-1518-2  
 COA  
 RERDF22560  
 Offsite Property No.  
 A050310

**SAMPLE ANALYSIS**

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	Gross Alpha: Gross Beta: Technetium-99	IC Anions - 300.0 (Chloride)	Method of Shipment
J03X48	WATER			Cool 4C	P	1	1000ml			
J03X49	WATER					2				
J03X50	WATER									
J03X51	WATER	8-24-05	1055							

**CHAIN OF POSSESSION**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
<i>[Signature]</i>	824051400	FED EX	
FED EX	08/25/05	FEM	08/25/05 9:30

**SPECIAL INSTRUCTIONS**

**LABORATORY SECTION** Received By  
 Title

**FINAL SAMPLE DISPOSITION** Disposal Method  
 Disposed By

Date/Time  
 Date/Time

RICHMOND, CA LABORATORY



SAMPLE RECEIPT CHECKLIST

Client: J. HANFORD City: MCHLAND State: WA  
 Date/Time received: 08/25/05 9:20 CoC No.: B05-039-1  
 Container I.D. No.: ERC-01 030 Requested TAT (Days): 45 P.D. 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: 4 Sample Matrix: W
7. Number of containers per sample: 2 (Or see CoC \_\_\_\_\_)  
 Yes  No [ ]
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: 1/6 Preservative \_\_\_\_\_
13. Describe any anomalies: \_\_\_\_\_

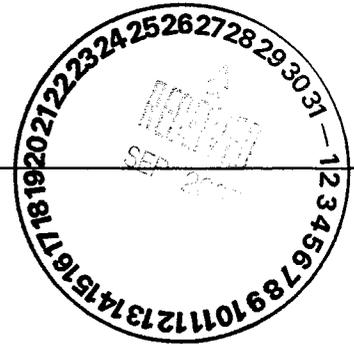
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date: \_\_\_\_\_  
 15. Inspected by: MFW Date: 08/25/05 Time: 10:30

Customer Sample No.	cpm	mR/hr	Wide	Customer Sample No.	cpm	mR/hr	Wide

Ion Chamber Ser. No. \_\_\_\_\_ Calibration date: \_\_\_\_\_  
 Alpha Meter Ser. No. \_\_\_\_\_ Calibration date: \_\_\_\_\_  
 Beta/Gamma Meter Ser. No. \_\_\_\_\_ Calibration date: \_\_\_\_\_



27 September 2005



Joan Kessner  
 Bechtel-Hanford, Inc.  
 3190 Washington Way  
 MSIN H9-03  
 Richland, WA 99352

**Subject: Contract No. 630  
 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 #	0508L223
SDG #	H3340
SAF #	<del>B05-004</del> B05-039 NB
Date Received	8-25-05 10/4/05
# Samples	4
Matrix	Water
Volatiles	
Semivolatiles	
Pest/PCB	
PAH	
DRO/KRO/GRO	
GC Alcohols	
Herbicides	
Metals	
Inorganics	X

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

Sincerely,  
 Lionville Laboratory Incorporated

Orlette S. Johnson  
 Project Manager

r:\group\pm\orlette\tnu-hanford\data\b\_ltrs.doc

Lionville Laboratory, Inc.  
 INORGANIC ANALYTICAL DATA PACKAGE FOR  
 TNUHANFORD B05-039 H3340

DATE RECEIVED: 08/25/05

LVL LOT # :0508L223

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
J03X48						
CHLORIDE BY IC	001	W	05LICA67	08/24/05	09/06/05	09/06/05
CHLORIDE BY IC	001 REP	W	05LICA67	08/24/05	09/06/05	09/06/05
CHLORIDE BY IC	001 MS	W	05LICA67	08/24/05	09/06/05	09/06/05
J03X49						
CHLORIDE BY IC	002	W	05LICA67	08/24/05	09/06/05	09/06/05
J03X50						
CHLORIDE BY IC	003	W	05LICA67	08/24/05	09/06/05	09/06/05
J03X51						
CHLORIDE BY IC	004	W	05LICA67	08/24/05	09/06/05	09/06/05
LAB QC:						
<hr/>						
CHLORIDE BY IC	MB1	W	05LICA67	N/A	09/06/05	09/06/05
CHLORIDE BY IC	MB1 BS	W	05LICA67	N/A	09/06/05	09/06/05



## Analytical Report

**Client:** TNU-HANFORD B05-039 H3340  
**LVL#:** 0508L223

**W.O.#:** 11343-606-001-9999-00  
**Date Received:** 08-25-05

### INORGANIC NARRATIVE

1. This narrative covers the analysis of 4 water samples.
2. The samples were prepared and analyzed in accordance with the method checked on the attached glossary.  

LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete list of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.
3. Sample holding times as required by the method and/or contract were met.
4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. The method blank was within the method criteria.
6. The Laboratory Control Sample (LCS) was within the laboratory control limits.
7. The matrix spike recovery was within the 75-125% control limits.
8. The replicate analysis was 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 Incorporated

9/13/08  
Date

njp\08-223

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR WATER SAMPLE ANALYSIS

	<u>EPA /600</u>	<u>SW846</u>	<u>OTHER</u>
Acidity	305.1		
___Alkalinity ___Bicarbonate ___Carbonate	310.1		
BOD	405.1		___ 5210B (b)
Ion Chromatography:			
___Bromide <input checked="" type="checkbox"/> Chloride ___Fluoride	<input checked="" type="checkbox"/> 300.0	___ 9056	
___Nitrate ___Nitrite ___Phosphate	300.0	___ 9056	
___Sulfate ___Formate ___Acetate ___Oxalate	300.0	___ 9056	
Chloride	325.2	___ 9251	
Chorine, Residual	330.5 (mod)		
Cyanide, Amenable to Chlorination	335.2	___ 9010B	
Cyanide, Total	335.2	___ 9010B	___ 9014 ___ ILMO4.0 (e)
Cyanide, Weak Acid Dissociable			___ 412 (a) ___ 4500CN-I (b)
COD	410.4(mod)		___ 5220C (b)
Color	110.2		
Corrosivity by Coupon		___ 1110(mod)	
Chromium VI		___ 7196A	___ 3500Cr-D (b)
Fluoride	340.2		___ 4500-FC
Hardness, Calcium	215.2		
Hardness, Total	130.2		
Iodide			___ ASTM D19P202 (1)
Surfactant	425.1		
___Nitrate-Nitrite ___Nitrate ___Nitrite	353.2		
Ammonia	350.3		
Total ___ Kjeldahl ___ Organic Nitrogen	351.3		
Total ___ Organic ___ Inorganic Carbon	415.1	___ 9060	
Oil & Grease	413.1	___ 9070	
___ pH ___ pH; paper	150.1	___ 9040B ___ 9041A	
Petroleum Hydrocarbons, Total Recoverable	418.1		
Phenol	420.1	___ 420.2 ___ 9065 ___ 9066	
___Ortho ___Total Phosphate	365.2		___ 4500-P B ___ C ___ 210A (a) ___ 2520 (b)
Salinity			
Settleable Solids	160.5		
Sulfide	376.1		___ 9030B/9034 (acid soluble)
Reactive ___Cyanide ___Sulfide		___ Section 7.3 (___ 9014 ___ 9030B)	
Silica	370.1		
Sulfite	377.1		
Sulfate	375.4	___ 9038	
Specific Conductance	120.1	___ 9050A	
Specific Gravity			___ D5057-90 ___ 213E (a)
Synthetic Precipitation Leach		___ 1312	
Total ___Dissolved ___Suspended ___Solids	160 ___ .1 ___ .2 ___ .3		
Total Organic Halides	450.1	___ 9020B	
Turbidity	180.1		
Volatile Solids:			
___Total ___Dissolved ___Suspended	160.4		
Other:		Method:	

## Lionville Laboratory Incorporated

### METHOD REFERENCES AND DATA QUALIFIERS

#### DATA QUALIFIERS

- U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.
- \* = Indicates that the original sample result is greater than 4x the spike amount added.

#### ABBREVIATIONS

- MB = Method or Preparation Blank.  
MS = Matrix Spike.  
MSD = Matrix Spike Duplicate.  
REP = Sample Replicate  
LC = Laboratory Control Sample.  
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

#### ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.
2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).
3. Test Methods for Evaluating Solid Waste (USEPA SW-846).
  - a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).
  - b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).
  - c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).
  - d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).
  - e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.
  - f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/09/05

CLIENT: TNUHANFORD B05-039 H3340  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L223

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J03X48	Chloride by IC	62.8	MG/L	2.5	10.0
-002	J03X49	Chloride by IC	79.0	MG/L	2.5	10.0
-003	J03X50	Chloride by IC	23.8	MG/L	2.5	10.0
-004	J03X51	Chloride by IC	30.6	MG/L	2.5	10.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/09/05

CLIENT: TNUHANFORD B05-039 H3340  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L223

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LICA67-MB1	Chloride by IC	0.25 u	MG/L	0.25	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/09/05

CLIENT: TNUHANFORD B05-039 H3340  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L223

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J03X48	Chloride by IC	160	62.8	100	97.5	20.0
BLANK10	05LICA67-MB1	Chloride by IC	4.7	0.25u	5.0	94.7	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/09/05

CLIENT: TNUHANFORD B05-039 H3340  
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0508L223

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J03X48	Chloride by IC	62.8	57.4	9.0	10.0

Lionville Laboratory Use Only  
0508L223

# Custody Transfer Record/Lab Work Request



FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

A See SRC

Client: TN Municipal 605-039  
 Est. Final Proj. Sampling Date: \_\_\_\_\_  
 Project #: 11393-006-001-9999-00  
 Project Contact/Phone #: \_\_\_\_\_  
 Lionville Laboratory Project Manager: DJ  
 QC Spec Del: Stel TAT: 30 Days  
 Date Rec'd: 8/25/05 Date Due: 9/24/05

Refrigerator #	Liquid Solid	INORG	Metal	CN
#/Type Container	Liquid Solid	ORGANIC		
Volume				
Preservatives				
ANALYSES REQUESTED				

MATRIX CODES: S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids L - EP/CLP WI - Wipe X - Other F - Fish	Lab ID	Client ID/Description	Matrix QC Chosen (✓)		Date Collected	Time Collected	Lionville Laboratory Use Only	
			MS	MSD			VOA	BNA
	001	J03X48			8/24/05	0830		
	002	49				0840		
	003	50				0845		
	004	51				1055		

Special Instructions:  
 002, 004 are solids  
 003, 001 - logged at water - analyze water portion.  
 RUN MATRIX QC.

Reinquired by	Received by	Date	Time
Paulex	Skinner	8/25/05	0905
Reinquired by	Received by	Date	Time
Reinquired by	Received by	Date	Time
Reinquired by	Received by	Date	Time
"COMPOSITE WASTE"	ORIGINAL		
	REWRITTEN		

**Bechtel Hanford Inc.** **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** **B05-039-1** **Page 1 of 1**

Collector: **SJ, GALE** Telephone No. **375-4688** Project Coordinator: **KESSNER, JH** Price Code: **B05-039** Data Turnaround: **45 Days**

Project Designation: **ERDF Lysimeter Sampling** Sampling Location: **ERDF CELLS 5&6** SAF No.: **B05-039** Air Quality:

Ice Chest No.: **52A 02 501** Field Logbook No.: **EL-1518-2** COA: **RERDF22560** Method of Shipment: **FED EX**

Shipped To: **EBERLINE SERVICES (LIONVILLE)** Bill of Lading/Air Bill No.: **SEE OSCP**

Offsite Property No.: **A050361**

**POSSIBLE SAMPLE HAZARDS/REMARKS**  
**ACIDIC**

**Special Handling and/or Storage**  
**NONE**

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	HNO3 to pH <2	Cool 4C
J03X48	WATER	8-24-05	0830		G/P	P
J03X49	WATER					
J03X50	WATER				2	1
J03X61	WATER				1000mL	500mL

**SAMPLE ANALYSIS**

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	HNO3 to pH <2	Cool 4C	Gross Alpha, Gross Beta, Technetium-99	IC Anions - 300.0 (Chloride)
J03X48	WATER	8-24-05	0830		G/P	P		
J03X49	WATER							
J03X50	WATER				2	1		
J03X61	WATER				1000mL	500mL		

**CHAIN OF POSSESSION**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
<i>SJ GALE</i>	82405 1400	<b>FED EX</b>	
<i>KL BEX</i>		<i>KL BEX</i>	8/25/05 0905

**SPECIAL INSTRUCTIONS**

**LABORATORY SECTION** Received By: \_\_\_\_\_ Title: \_\_\_\_\_ Date/Time: \_\_\_\_\_

**FINAL SAMPLE DISPOSITION** Disposal Method: \_\_\_\_\_ Disposed By: \_\_\_\_\_ Date/Time: \_\_\_\_\_

**Bechtel Hanford Inc.** Page 1 of 1  
**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**  
 Project Coordinator: KESSNER, JH  
 Telephone No.: 375-4688  
 Price Code: B05-039-1  
 Data Turnaround: 45 Days  
 Project Designation: ERDF Lysimeter Sampling  
 Sampling Location: ERDF CELLS 5&6  
 SAF No.: B05-039  
 Air Quality:

Project No.: ERC 02 501  
 Method of Shipment: FED EX  
 Field Logbook No.: EL-1518-2  
 COA: RERDF22560  
 Bill of Lading/Air Bill No.: SEE OSPC  
 Offsite Property No.: 4050361

Shipped To: EBERLINE SERVICES / LIONVILLE

POSSIBLE SAMPLE HAZARDS/REMARKS: *None*

Special Handling and/or Storage: *None*

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	Cool AC
J03X48	<del>WATER</del>				G/P	2	1000mL	P
J03X49	WATER	8-24-05	0840					
J03X50	WATER							
J03X51	WATER							

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Cool AC	IC Anions - 300.0 (Chloride)
J03X48	<del>WATER</del>				
J03X49	WATER	8-24-05	0840		
J03X50	WATER				
J03X51	WATER				

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
<i>SLABER</i>	8/24/05 1400	<i>FED EX</i>	
<i>FED EX</i>		<i>SLABER</i>	8/25/05 0905
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
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

LABORATORY SECTION: Received By

FINAL SAMPLE DISPOSITION: Disposed By

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

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

Bechtel Hanford Inc.  
 Company Contact  
 KESSNER, JH  
 Telephone No.  
 375-4688

Project Coordinator  
 KESSNER, JH  
 SAF No.  
 B05-039

Project Designation  
 ERDF Lysimeter Sampling  
 Sampling Location  
 ERDF CELLS 5&6

Field Logbook No.  
 EL-1518-2  
 COA  
 RERDF22560

Offsite Property No.  
 A050361

Shipped To  
 EBERLINE SERVICES LIONVILLE  
 Method of Shipment  
 FED EX  
 Bill of Lading/Air Bill No.  
 SEE OSPC

Preservation	HNO3 to pH	Cool AC
G/P	2	P
Type of Container	2	I
No. of Container(s)	1000mL	500mL
Volume	IC Anions - 300.0 (Chloride)	

**POSSIBLE SAMPLE HAZARDS/REMARKS**  
 ACIDIC

**Special Handling and/or Storage**  
 NONE

**SAMPLE ANALYSIS**

Sample No.	Matrix *	Sample Date	Sample Time
J03X48	WATER		
J03X49	WATER		
J03X50	WATER	8 24 05	1045
J03X51	WATER		

**CHAIN OF POSSESSION**

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
STACEY [Signature]	8 21 05 1400	FED EX	
FLDEX		[Signature]	8 25 05 0905
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
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

LABORATORY SECTION	Received By	Title
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By

Matrix \*  
 S-Soil  
 SE-Sediment  
 SO-Solid  
 SI-Sludge  
 W-Water  
 O-Oil  
 A-Air  
 DS-Dryn Solids  
 DL-Dryn Liquids  
 T-Tissue  
 WJ-Wipe  
 L-Liquid  
 V-Vegetation  
 X-Other

**Bechtel Hanford Inc.**      **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**      Page 1 of 1

Collector: SJ, GALE      Project Coordinator: KESSNER, JH      Price Code: B05-039-1      Data Turnaround: 45 Days

Project Designation: ERDF Lysimeter Sampling      SAF No.: B05-039      Air Quality:

Ice Chest No.: ERC 02 501      Method of Shipment: FED EX

Company Contact: KESSNER, JH      Telephone No.: 375-4688      Bill of Lading/Air Bill No.: SEE OSFC

Sampling Location: ERDF CELLS 5&6      COA: RERDF22560

Field Logbook No.: EL-1518-2      Offsite Property No.: A050361

Shipped To: EBERLINE SERVICES (LIONVILLE)

POSSIBLE SAMPLE HAZARDS/REMARKS: NONE

Special Handling and/or Storage: NONE

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	Type of Container	No. of Container(s)	Volume	Cool AC
J03X48	WATER			G/P	2	1	1000mL	P
J03X49	WATER							
J03X50	WATER							
J03X51	WATER	8-24-05	1055					

**SAMPLE ANALYSIS**

IC Analysis - 300.0 (Chloride)

Gross Alpha; Gross Beta; Technetium-99

**CHAIN OF POSSESSION**

Relinquished By/Removed From	Date/Time	Sign/Print Names	Received By/Stored In	Date/Time
State of WA	82405 1400	FER EX		
FER EX			Received By/Stored In	8/25/05 0905
			Received By/Stored In	
			Received By/Stored In	
			Received By/Stored In	
			Received By/Stored In	

**LABORATORY SECTION**      Received By: \_\_\_\_\_      Title: \_\_\_\_\_

**FINAL SAMPLE DISPOSITION**      Disposed By: \_\_\_\_\_      Date/Time: \_\_\_\_\_

**Lionville Laboratory Incorporated**  
**SAMPLE RECEIPT CHECKLIST (SRC)**

CLIENT: *TNU Hartford*

Date: *8/25/05*

Purchase Order / Project# /  
 SAF# / SOW# / Release #: *B05-039*

LvLI Batch #: *0508L223*

Sample Custodian: *[Signature]*

NOTE: EXPLAIN ALL DISCREPANCIES

- |   |   |   |
|---|---|---|
| 1. Samples Hand Delivered or <u>Shipped</u>   | Carrier <i>fedex</i>  | Airbill# <i>7925 09835512</i>                                 |
| 2. Custody seals on coolers or shipping container intact, signed and dated?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                       | <input type="checkbox"/> No Seals    Comments                 |
| 3. Outside of coolers or shipping containers are free from damage?  | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                       |   |
| 4. All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible? | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                       |   |
| 5. Samples received <u>cooled</u> or ambient?   | Temp <i>1.9</i> °C  | Cooler # <i>ERC-02-051</i><br><i>JP 8/25/05</i><br><i>501</i> |
| 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 signed and 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                       |   |
| 10. All sample label information matches coc?   | <del><input checked="" type="checkbox"/> Yes</del> <input checked="" type="checkbox"/> No | <i>002,004 - coc soap matrix in water, samples are solids</i> |
| 11. Samples properly preserved?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                       |   |
| 12. Samples received within hold times? Short holds taken to wet lab?   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                       | <i>water absorbed in "foam"</i>                               |
| 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 type="checkbox"/> Yes <input type="checkbox"/> No                                  | <input checked="" type="checkbox"/> N/A                       |
| 15. Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)     | <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No            | <i>not 9-12-05 → liquid analyzed</i>                          |
| 16. Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)                             | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                       | <input type="checkbox"/> No Discrepancies                     |

SR-002-B

