REVIEW COMMENT RECORD (RCR)

1. Date 06/01/05	2. Review No.
3. Project No. 200-LW-1/LW-2	4. Page 1 of 2

5. Document Number(s)/Title(s)	6. Program/Project/Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
Validation Package for SDG H3046	Borehole Soil Sampling	RL Weiss	ERC - S&DM	Sigma 1 372-9631

17. Comment Submittal Approval:	10. Agreement with indicated comment disposition(s)	11. Closed
Organization Manager (Optional)	R. L. Weiss Reviewer/Point of Contract 06/01/2005 Date R. L. Weiss Author/Originator	Reviewer/Point of Contact 6-14-05 Date Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Reviewer Concurrence Required	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Radiochemistry, Page 11; Ni-63 for sample B19403 should be flagged as having missed RTQL criteria. Missed RTQL counts are correct			OK RLW

Ayres, Doris E

From: Thackaberry, W R (Bill)
Sent: Monday, May 16, 2005 8:27 AM
To: Ayres, Doris E
Subject: Validation review.

I have looked at Data Package H3046 - Radiochemistry and I have no comment. Do you want the preliminary copy back?
Bill Thackaberry

Final Data 6/16/05 Daynes

~~PRELIMINARY COPY~~

JUN 2005 RECEIVED

Date: 4 May 2005
To: Fluor Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200-LW-1/LW-2 Characterization - Soil
Subject: Radiochemistry - Data Package No. H3046

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3046 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample	Media	Validation	Analysis
B19403	2/10/05	Soil	C	See note 1 & 2
B19405	2/8/05	Soil	C	See note 1 & 2
B19427	2/14/05	Soil	C	See note 2

1 - Isotopic thorium (aspec), tritium, technetium-99, nickel-63, carbon-14, tritium, strontium-90, and gamma spectroscopy.
2 - Alpha spectroscopy (isotopic uranium, isotopic plutonium, neptunium-237 and americium-241) and total uranium.

Data validation was conducted in accordance with the FHI validation statement of work and the 200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan (DOE/RL-2001-66, Draft A, Redline, May 2002). Appendices 1 through 6 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation
Appendix 6. Additional Documentation Requested by Client

DATA QUALITY OBJECTIVES

- **Holding Times**

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analysis is 6 months.

All holding times were acceptable.

- **Laboratory (Method) Blanks**

Laboratory Blanks

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the required detection limit (RDL), the following qualifiers are applied: All positive sample results less than five times the highest blank concentration are qualified as estimates and flagged "J"; sample results below the minimum detectable activity (MDA) are qualified as undetected and flagged "U"; sample results above the MDA and greater than five times the highest blank concentration are not qualified.

All laboratory blank results were acceptable, although several analytes exceeded the RTQL.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample (LCS) and matrix spike (MS) recovery range is either 65-135% or 70-130%, depending on the analyte. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the lack of an LCS analysis, all thorium-228(aspec) and thorium-232(aspec) results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the contract required detection

limit (CRDL) and the RPD is less than +/- 35 percent, the results are acceptable. If either activities are less then five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD outside QC limits (50%), all europium-154 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels are compared against the required target quanitation limits (RTQLs) to ensure that laboratory detection levels meet the required criteria. Twenty analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific RTQL.

- **Completeness**

Data package SDG No. H3046 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of an LCS analysis, all thorium-228(aspec) and thorium-232(aspec) results were qualified as estimates and flagged "J". Due to an RPD outside QC limits (50%), all europium-154 results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the FHI validation SOW, the data may be

usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Twenty analytes exceeded the RTQL. Under the FHI statement of work, no qualification is required.

REFERENCES

FHI, Contract #20266, *Validation Statement of Work*, Fluor Hanford Incorporated, July 7, 2003.

DOE/RL-2001-66, Draft A, Redline, *200-LW-1/200-LW-2 Chemical Laboratory Waste Group OUs RI/FS Work Plan*, May 2002.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the FHI statement of work are as follows:

U - Indicates the compound or analyte was analyzed for and not detected above the minimum detectable activity (MDA) in the sample. The value reported is the sample result corrected for sample dilution and moisture content by the laboratory. The data is usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected at concentrations above the minimum detectable activity (MDA) in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate, but is usable for decision making purposes.

J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.

Appendix 2

Summary of Data Qualification

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: H3046	REVIEWER: TLI	DATE: 5/4/05	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-228(aspec) Thorium-232(aspec)	J	All	No LCS analysis
Europium-154	J	All	RPD

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: FLUOR-HANFORD							
Laboratory: EB							
Case	SDG: H3046						
Sample Number		B19403		B19405		B19427	
Remarks							
Sample Date		2/10/05		2/8/05		2/14/05	
Radiochemistry	RTQL	Result	Q	Result	Q	Result	Q
Tritium	400	-23.6	U	1.47	U	0.899	U
Carbon-14	50	14.7	U*	5.22	U	-1.38	U
Nickel-63	30	-14.2	U*	418	U*	-4.88	U
Total Strontium	1	34200		437000		5100	
Technetium-99	15	11.0		5.67		-0.743	U
Thorium-228(aspec)		0.711	UJ	-3.50	UJ	0.538	J
Thorium-230(aspec)		-1.56	U	1.40	U	0.167	U
Thorium-232(aspec)	1	0	UJ*	2.10	UJ*	0.458	J
Potassium-40		14.0		U	U	U	U
Cobalt-60	0.05	17.5		58.3		2.68	
Antimony-125		U	U	U	U	U	U
Cesium-134		U	U	U	U	U	U
Cesium 137	0.1	563		2800		1.03	
Radium-226		U	U	U	U	U	U
Radium-228		U	U	U	U	U	U
Europium-152	0.1	U	U*	U	U*	U	U*
Europium-154	0.1	5.54	J	10.5	J	U	UJ*
Europium-155	0.1	U	U*	U	U*	U	U*
Thorium-228		U	U	U	U	U	U
Thorium-232		U	U	U	U	U	U
Uranium-235(gea)		U	U	U	U	U	U
Uranium-238(gea)		U	U	U	U	U	U
Americium-241(gea)		4760.0		6220		65.4	
Total Uranium (ug/g)		5.06		27.9		NA	
Uranium-233/234(aspec)	1	2.82	U*	14.9	U*	NA	
Uranium-235(aspec)	1	0	U*	0	U*	NA	
Uranium-238(aspec)	1	8.48	U*	29.7	U*	NA	
Neptunium-237	1	0	U*	42.3	U*	NA	
Plutonium-238	1	388		5770		NA	
Plutonium-239/240	1	33900		472000		NA	
Americium-241	1	5340		60600		NA	
NA = Not analyzed							

* - RTQL exceeded

Laboratory applied non-detect qualifiers "U" have been included in this table to minimize potential miss-interpretation of results. All other qualifiers shown were applied during validation.

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502208-01 B19403

DATA SHEET

SDG	7252	Client/Case no	Hanford SDG H3046
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R502208-01	Client sample id	B19403
Dept sample id	7252-001	Location/Matrix	216-Z-7; SOLID
Received	02/23/05	Collected/Weight	02/10/05 12:45 84 g
% solids	95.7	Custody/SAF No	F03-025-181 F03-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	-23.6	37	66	400	U	H
Carbon 14	14762-75-5	14.7	33	56	50	U	C
Nickel 63	13981-37-8	-14.2	96	160	30	U	NI_L
Total Strontium	SR-RAD	34200	360	28	1.0		SR
Technetium 99	14133-76-7	11.0	1.1	2.1	15		TC
Thorium 228	14274-82-9	0.711	1.4	2.0		U J	TH
Thorium 230	14269-63-7	-1.56	4.5	9.7	1.0	U	TH
Thorium 232	TH-232	0	1.1	2.5	1.0	U J	TH
Total Uranium (ug/g)	7440-61-1	5.06	0.55	0.080	1.0		U_T
Uranium 233/234	U-233/234	2.82	5.7	22	1.0	U	U
Uranium 235	15117-96-1	0	6.8	26	1.0	U	U
Uranium 238	U-238	8.48	11	22	1.0	U	U
Neptunium 237	13994-20-2	0	7.0	11	1.0	U	NP
Plutonium 238	13981-16-3	388	64	17	1.0		PU
Plutonium 239/240	PU-239/240	33900	2300	17	1.0		PU
Americium 241	14596-10-2	5340	480	25	1.0		AM
Potassium 40	13966-00-2	14.0	5.4	4.5			GAM
Cobalt 60	10198-40-0	17.5	1.6	0.96	0.050		GAM
Antimony 125	14234-35-6	U		6.6		U	GAM
Cesium 134	13967-70-9	U		1.5		U	GAM
Cesium 137	10045-97-3	563	6.0	2.4	0.10		GAM
Radium 226	13982-63-3	U		3.1		U	GAM
Radium 228	15262-20-1	U		4.5		U	GAM
Europium 152	14683-23-9	U		6.3	0.10	U	GAM
Europium 154	15585-10-1	5.54	2.1	1.9	0.10	J	GAM
Europium 155	14391-16-3	U		9.4	0.10	U	GAM
Thorium 228	14274-82-9	U		3.3		U	GAM
Thorium 232	TH-232	U		4.5		U	GAM

200-LW-1/LW-2 Characterization-Soil

K 5/1/05

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/15/05

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DATA SHEETS
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SUMMARY DATA SECTION
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502208-01 B19403

DATA SHEET, cont

SDG	7252	Client/Case no	Hanford	SDG H3046
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R502208-01	Client sample id	B19403	
Dept sample id	7252-001	Location/Matrix	216-Z-7;	SOLID
Received	02/23/05	Collected/Weight	02/10/05 12:45	84 g
% solids	95.7	Custody/SAF No	F03-025-181	F03-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 235	15117-96-1	U		11		U	GAM
Uranium 238	U-238	U		130		U	GAM
Americium 241	14596-10-2	4760	18	12			GAM

200-LW-1/LW-2 Characterization-Soil

5/1/05

DATA SHEETS
Page 2
SUMMARY DATA SECTION
Page 17

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/15/05

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502208-02 B19405

DATA SHEET

SDG	7252	Client/Case no	Hanford	SDG H3046	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R502208-02	Client sample id	B19405		
Dept sample id	7252-002	Location/Matrix	216-Z-7;17.5'-20.0'	SOLID	
Received	02/23/05	Collected/Amount	02/08/05 14:00	96 g	
% solids	95.1	Custody/SAF No	F03-025-182	F03-025	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	1.47	16	27	400	U	H
Carbon 14	14762-75-5	5.22	13	22	50	U	C
Nickel 63	13981-37-8	418	310	500	30	U	NI_L
Total Strontium	SR-RAD	437000	2100	75	1.0		SR
Technetium 99	14133-76-7	5.67	0.63	0.97	15		TC
Thorium 228	14274-82-9	-3.50	5.6	11		U J	TH
Thorium 230	14269-63-7	1.40	22	48	1.0	U	TH
Thorium 232	TH-232	2.10	7.0	13	1.0	U J	TH
Total Uranium (ug/g)	7440-61-1	27.9	3.1	0.40	1.0		U_T
Uranium 233/234	U-233/234	14.9	30	110	1.0	U	U
Uranium 235	15117-96-1	0	36	140	1.0	U	U
Uranium 238	U-238	29.7	30	110	1.0	U	U
Neptunium 237	13994-20-2	42.3	42	63	1.0	U	NP
Plutonium 238	13981-16-3	5770	640	85	1.0		PU
Plutonium 239/240	PU-239/240	472000	32000	84	1.0		PU
Americium 241	14596-10-2	60600	4500	100	1.0		AM
Potassium 40	13966-00-2	U		19		U	GAM
Cobalt 60	10198-40-0	58.3	3.1	1.7	0.050		GAM
Antimony 125	14234-35-6	U		15		U	GAM
Cesium 134	13967-70-9	U		2.8		U	GAM
Cesium 137	10045-97-3	2800	15	5.5	0.10		GAM
Radium 226	13982-63-3	U		6.9		U	GAM
Radium 228	15262-20-1	U		8.4		U	GAM
Europium 152	14683-23-9	U		14	0.10	U	GAM
Europium 154	15585-10-1	10.5	3.9	4.4	0.10	J	GAM
Europium 155	14391-16-3	U		18	0.10	U	GAM
Thorium 228	14274-82-9	U		6.8		U	GAM
Thorium 232	TH-232	U		8.4		U	GAM

200-LW-1/LW-2 Characterization-Soil

JR 5/1/05

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/15/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502208-02 B19405

DATA SHEET, cont

SDG	7252	Client/Case no	Hanford	SDG H3046	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R502208-02	Client sample id	B19405		
Dept sample id	7252-002	Location/Matrix	216-Z-7;17.5'-20.0'	SOLID	
Received	02/23/05	Collected/Amount	02/08/05 14:00	96 g	
% solids	95.1	Custody/SAF No	F03-025-182	F03-025	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 235	15117-96-1	U		21		U	GAM
Uranium 238	U-238	U		230		U	GAM
Americium 241	14596-10-2	6220	24	21			GAM

200-LW-1/LW-2 Characterization-Soil

5/1/05

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/15/05

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502208-03 B19427

DATA SHEET

SDG	7252	Client/Case no	Hanford SDG H3046
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R502208-03	Client sample id	B19427
Dept sample id	7252-003	Location/Matrix	216-Z-7;27.5ft-30ft SOLID
Received	02/23/05	Collected/Weight	02/14/05 14:00 330 g
% solids	96.5	Custody/SAF No	F03-025-149 F03-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Tritium	10028-17-8	0.899	2.6	4.4	400	U	H
Carbon 14	14762-75-5	-1.38	2.0	3.5	50	U	C
Nickel 63	13981-37-8	-4.88	8.1	14	30	U	NI_L
Total Strontium	SR-RAD	5100	40	2.5	1.0		SR
Technetium 99	14133-76-7	-0.743	2.3	5.4	15	U	TC
Thorium 228	14274-82-9	0.538	0.13	0.080		J	TH
Thorium 230	14269-63-7	0.167	0.25	0.50	1.0	U	TH
Thorium 232	TH-232	0.458	0.13	0.15	1.0	J	TH
Potassium 40	13966-00-2	U		10		U	GAM
Cobalt 60	10198-40-0	2.68	0.84	0.70	0.050		GAM
Antimony 125	14234-35-6	U		2.8		U	GAM
Cesium 134	13967-70-9	U		1.5		U	GAM
Cesium 137	10045-97-3	1.03	0.68	0.93	0.10		GAM
Radium 226	13982-63-3	U		2.1		U	GAM
Radium 228	15262-20-1	U		3.6		U	GAM
Europium 152	14683-23-9	U		3.0	0.10	U	GAM
Europium 154	15585-10-1	U		1.9	0.10	U J	GAM
Europium 155	14391-16-3	U		3.3	0.10	U	GAM
Thorium 228	14274-82-9	U		1.6		U	GAM
Thorium 232	TH-232	U		3.6		U	GAM
Uranium 235	15117-96-1	U		4.7		U	GAM
Uranium 238	U-238	U		100		U	GAM
Americium 241	14596-10-2	65.4	2.5	2.7			GAM

200-LW-1/LW-2 Characterization-Soil

5/1/05

Lab id	EBRLNR
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/15/05

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H3046 was composed of three solid (soil) samples designated under SAF No. F03-025 with a Project Designation of: 200-LW-1/LW-2 Characterization-Soil.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.5 Technetium-99 Analyses

The relative percent difference in the original and duplicate results was 98%, greater than the 3σ protocol limit of 36%. The difference between the sample result and the duplicate result (7.24 pCi/g) was less than the RDL (15 pCi/g).

2.6 Isotopic Uranium Analyses

No problems were encountered during the course of the analyses.

2.7 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.8 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

2.9 Neptunium-237 Analyses

The LCS tracer yield was 18%. No other problems were encountered during the course of the analyses.

2.10 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.11 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.12 Gamma Spectroscopy

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 Mannion
Melissa C. Mannion
Senior Program Manager

4/15/5
Date

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-181	PAGE 1 OF 1
COLLECTOR Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N AIR QUALITY ☐	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION 216-Z-7;	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil H3046 (7252)		SAF NO. F03-025		
ICE CHEST NO. GRP-03-025	FIELD LOGBOOK NO.	COA 119143ES10	METHOD OF SHIPMENT Federal Express		
SHIPPED TO Eberline Services	OFFSITE PROPERTY NO. SU RSR E0003		BILL OF LADING/AIR BILL NO. SU RSR E0003		

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
~~N/A~~ MAB 2/22/05
Rad tu to B19414

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	None
TYPE OF CONTAINER	GP
NO. OF CONTAINER(S)	1
VOLUME	120mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B19403	SOIL	2/10/05	1245	X									

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
MD-236 Full 3	2/22/05 2905	M.H. Bauchler M.G. Bauchler	2/22/05 2905
M.H. Bauchler M.G. Bauchler	2/22/05 2905	Fed Ex	
FED EX	2/23/05	AK	2/23/05 10:00

SPECIAL INSTRUCTIONS
This sample transferred from WSCF.
(1)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - Add-on {Antimony-125, Cesium-134} Isotopic Plutonium; Isotopic Uranium; Americium-241; Neptunium-237; Total Uranium; Nickel-63; Gamma Spec - Radium {Radium-226, Radium-228} Technetium-99; Isotopic Thorium {Thorium-232} Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr;

Original COC attached to document chain of possession.

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

A-6003-618(03/03)

000019

00000052

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-182	PAGE 1 OF 1
COLLECTOR Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE BN AIR QUALITY ☐	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION 216-Z-7; 17.5'-20.0'	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil H3046 (7252)		SAF NO. F03-025		
ICE CHEST NO. GRR 03-025	FIELD LOGBOOK NO.	COA 119143ES10	METHOD OF SHIPMENT Federal Express		
SHIPPED TO Eberline Services	OFFSITE PROPERTY NO. Jeu RSR E0003		BILL OF LADING/AIR BILL NO. Jeu RSR E0003		

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
~~N/A~~ NAB 2/22/05
Rad tu to B19415

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B19405	SOIL	2/8/05	1400	X									

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM MO-026 RCT B 2/22/05 0850	DATE/TIME	RECEIVED BY/STORED IN M.A. Bauchler M.G. Bauchler 2/22/05	DATE/TIME
RELINQUISHED BY/REMOVED FROM M.A. Bauchler M.G. Bauchler 2/22/05 0850	DATE/TIME	RECEIVED BY/STORED IN Fed EX	DATE/TIME
RELINQUISHED BY/REMOVED FROM FED EX 2/23/05	DATE/TIME	RECEIVED BY/STORED IN AK 2/23/05 10:00	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
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
This sample transferred from WSCF.
(1)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - Add-on {Antimony-125, Cesium-134} Isotopic Plutonium; Isotopic Uranium; Americium-241; Neptunium-237; Total Uranium; Nickel-63; Gamma Spec - Radium {Radium-226, Radium-228} Technetium-99; Isotopic Thorium {Thorium-232} Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr;
Original COC attached to document chain of possession

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

A-6003-618(03/03)

000020

00000053

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-025-149	PAGE 1 OF 1

COLLECTOR: Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT: TRENT, STEVE	TELEPHONE NO.: 373-5689	PROJECT COORDINATOR: TRENT, SJ
SAMPLING LOCATION: 216-Z-7; 27.5ft-30ft	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil H3046 (7252)		SAF NO.: F03-025
ICE CHEST NO.: GRP-03-025	FIELD LOGBOOK NO.: HNF-N-356 1	COA: 119143ES10	METHOD OF SHIPMENT: Federal Express
SHIPPED TO: Eberline Services	OFFSITE PROPERTY NO.: See RSR E0003		BILL OF LADING/AIR BILL NO.: See RSR E0003

PRICE CODE: 8N

AIR QUALITY: ☐

DATA TURNAROUND: 45 Days / 45 Days

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

POSSIBLE SAMPLE HAZARDS/ REMARKS: N/A

SPECIAL HANDLING AND/OR STORAGE: Radioactive Tie to: B19416

PRESERVATION	Cool 4C	None										
TYPE OF CONTAINER	aG	aG										
NO. OF CONTAINER(S)	1	1										
VOLUME	250mL	250mL										
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS										

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B19427	SOIL	2/14/05	1400		X							

CHAIN OF POSSESSION / SIGN/ PRINT NAMES

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
MRWeil/MRWeil	2/15/05 1010	FRIDGE Z-7	2/15/05 1010
Z-7 site Fridge	2/22/05 0730	David Tyra/David Tyra	0730 2/22/05
David Tyra/David Tyra	2/22/05 0830	MO-026 Fridge #3	0830 2/22/05
MO-026 Fridge #3	2/22/05 0855	M.H. Bachelor/M.H. Bachelor	2/22/05 0855
M.H. Bachelor/M.H. Bachelor	2/22/05 0855	Fed EX	
FED EX	2/28/05	JK	2/28/05 10:00

SPECIAL INSTRUCTIONS

~~(1)Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030; Oil & Grease - 413.1;~~ (2)Nickel-63; Gamma Spec - Radium ~~{Radium-226, Radium-228}~~ Technetium-99; Isotopic Thorium {Thorium-232} Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr;

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

000021

00000054

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		F03-025-149	PAGE 1 OF 1
COLLECTOR: Pope/Pfister/Tyra/Wiberg	COMPANY CONTACT: TRENT, STEVE	TELEPHONE NO.: 373-5689	PROJECT COORDINATOR: TRENT, SJ	PRICE CODE: 8N; DATA TURNAROUND: 45 Days / 45 Days
SAMPLING LOCATION: 216-Z-7; 27.5ft-30ft	PROJECT DESIGNATION: 200-LW-1/LW-2 Characterization - Soil H3046 (7252)		SAF NO.: F03-025	AIR QUALITY ☐
ICE CHEST NO.: GRP-03-025	FIELD LOGBOOK NO.: HNF-N-356 1	COA: 119143ES10	METHOD OF SHIPMENT: Federal Express	
SHIPPED TO: Eberline Services	OFFSITE PROPERTY NO.: Su RSR E0003		BILL OF LADING/AIR BILL NO.: Su RSR E0003	

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

POSSIBLE SAMPLE HAZARDS/ REMARKS: N/A

SPECIAL HANDLING AND/OR STORAGE: N/A

Radioactive Tie to: B19416

PRESERVATION				Cool 4C	None							
TYPE OF CONTAINER				aG	aG							
NO. OF CONTAINER(S)				1	1							
VOLUME				250mL	250mL							
SAMPLE ANALYSIS				SEE ITEM (1) IN SPECIAL INSTRUCTIONS	SEE ITEM (2) IN SPECIAL INSTRUCTIONS							
SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B19427	SOIL	2/14/05	1400		X							

DMT 8-11-04

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: MR Weil/MR Weil	DATE/TIME: 2/15/05 1010	RECEIVED BY/STORED IN: FRIDGE Z-7	DATE/TIME: 2/15/05 1010
RELINQUISHED BY/REMOVED FROM: Z-7 site Fridge	DATE/TIME: 2/22/05 0730	RECEIVED BY/STORED IN: David Tyra/[signature]	DATE/TIME: 0730 2/22/05
RELINQUISHED BY/REMOVED FROM: David Tyra/[signature]	DATE/TIME: 2/22/05 0830	RECEIVED BY/STORED IN: MO-026 Fridge #3	DATE/TIME: 0830 2/22/05
RELINQUISHED BY/REMOVED FROM: MO-026 Fridge #3	DATE/TIME: 2/22/05 0855	RECEIVED BY/STORED IN: M.H. Bauchner/M.H. Bauchner	DATE/TIME: 2/22/05 0855
RELINQUISHED BY/REMOVED FROM: M.H. Bauchner/M.H. Bauchner	DATE/TIME: 2/22/05 0855	RECEIVED BY/STORED IN: FED EX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: FED EX	DATE/TIME: 2/23/05	RECEIVED BY/STORED IN: [signature]	DATE/TIME: 2/23/05 10:00
RELINQUISHED BY/REMOVED FROM:	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME:

SPECIAL INSTRUCTIONS: ~~(1)Chromium Hex - 7196; NO2/NO3 - 353.2; Sulfides - 9030; Oil & Grease - 413.1;~~ (2)Nickel-63; Gamma Spec - Radium ~~{Radium-226, Radium-228}~~ Technetium-99; Isotopic Thorium {Thorium-232} Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr;

DMT 8-11-04

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

000022

00000054

Fluor Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			F03-025-182	PAGE 1 OF 1
COLLECTOR Pope/Pfister/Wiberg/Tyra	COMPANY CONTACT TRENT, STEVE	TELEPHONE NO. 373-5689	PROJECT COORDINATOR TRENT, SJ	PRICE CODE 8N AIR QUALITY ☐	DATA TURNAROUND 45 Days / 45 Days
SAMPLING LOCATION 216-Z-7; 17.5'-20.0'	PROJECT DESIGNATION 200-LW-1/LW-2 Characterization - Soil H3046 (7252)		SAF NO. F03-025		
ICE CHEST NO. GRR 03-025	FIELD LOGBOOK NO.	COA 119143ES10	METHOD OF SHIPMENT Federal Express		
SHIPPED TO Eberline Services	OFFSITE PROPERTY NO. Jeu RSR E0003		BILL OF LADING/AIR BILL NO. Jeu RSR E0003		

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
N/A MAB 2/22/05
Rad tu to B19415

SPECIAL HANDLING AND/OR STORAGE
N/A

PRESERVATION	None
TYPE OF CONTAINER	G/P
NO. OF CONTAINER(S)	1
VOLUME	60mL
SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B19405	SOIL	2/8/05	1400	X

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM MO-026 RC 3	DATE/TIME 2/22/05 0850	RECEIVED BY/STORED IN M.G. Bauchler M.G. Bauchler	DATE/TIME 2/22/05 850
RELINQUISHED BY/REMOVED FROM M.G. Bauchler M.G. Bauchler	DATE/TIME 2/22/05	RECEIVED BY/STORED IN Fed Ex	DATE/TIME
RELINQUISHED BY/REMOVED FROM FED EX 2/23/05	DATE/TIME	RECEIVED BY/STORED IN AK 2/23/05 10:00	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
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
This sample transferred from WSCF.
(1)Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155} Gamma Spec - Add-on {Antimony-125, Cesium-134} Isotopic Plutonium; Isotopic Uranium; Americium-241; Neptunium-237; Total Uranium; Nickel-63; Gamma Spec - Radium {Radium-226, Radium-228} Technetium-99; Isotopic Thorium {Thorium-232} Tritium - H3; Carbon-14; Strontium-89,90 -- Total Sr;
Original COC attached to document chain of possession

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

A-6003-618(03/03)

000023

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Appendix 5

Data Validation Supporting Documentation

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-LW-1/LW-2			DATA PACKAGE: #3046		
VALIDATOR: TLF		LAB: EB		DATE: 4/27/05	
			SDG: #3046		
ANALYSES PERFORMED					
~~Gross Alpha/Beta~~ Total Uranium	Strontium-90 ~~Radium-22~~	~~Technetium-99~~ Tritium	Alpha Spectroscopy ~~Total Alpha~~	~~Gamma Spectroscopy~~ Ni-63	C-14
SAMPLES/MATRIX					
B19403	B19405	B19427			

1. Completeness ..... ☒ N/A

Technical verification forms present? ..... Yes No N/A

Comments: _____

2. Initial Calibration (Levels D, E) ..... ☒ N/A

Instruments/detectors calibrated? ..... Yes No N/A

Initial calibration acceptable? ..... Yes No N/A

Standards NIST traceable? ..... Yes No N/A

Standards Expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E) ☒ N/A

Calibration checked within required frequency? ..... Yes No N/A

Calibration check acceptable? ..... Yes No N/A

Calibration check standards traceable? ..... Yes No N/A

Calibration check standards expired? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

4. Background Counts (Levels D, E) ..... ☒ N/A

Background Counts checked within required frequency? ..... Yes No N/A

Background Counts acceptable? ..... Yes No N/A

Calculation check acceptable? ..... Yes No N/A

Comments: _____

_____

_____

_____

_____

5. Blanks (Levels B, C, D, E) ..... ☐ N/A

Method blank analyzed within required frequency? ..... Yes No N/A

Method blank results acceptable? ..... Yes No N/A

Analytes detected in method blank? ..... Yes No N/A

Field blank(s) analyzed? ..... Yes No N/A

Field blank results acceptable? ..... Yes No N/A

Analytes detected in field blank(s)? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: No FB

Several over RDL in MB

6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) ..... ☐ N/A

LCS /BSS analyzed within required frequency? ..... Yes No N/A

LCS/BSS recoveries acceptable? ..... Yes No N/A

LCS/BSS traceable? (Levels D,E) ..... Yes No N/A

LCS/BSS expired? (Levels D,E) ..... Yes No N/A

LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments:

7. Chemical Carrier Recovery (Levels C, D, E) ..... ☐ N/A

Chemical carrier added? ..... Yes No N/A

Chemical recovery acceptable? ..... Yes No N/A

Chemical carrier traceable? (Levels D, E) ..... Yes No N/A

Chemical carrier expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

8. Tracer Recovery (Levels C, D, E) ..... ☐ N/A

Tracer added? ..... Yes No N/A

Tracer recovery acceptable? ..... Yes No N/A

Tracer traceable? (Levels D, E) ..... Yes No N/A

Tracer expired? (Levels D, E) ..... Yes No N/A

Transcription/Calculation errors? (Levels D, E) ..... Yes No N/A

Comments: _____

9. Matrix Spikes (Levels C, D, E) ..... ☒ N/A

Matrix spike analyzed? ..... Yes No N/A

Spike recoveries acceptable? ..... Yes No N/A

Spike source traceable? (Levels D, E) ..... Yes No N/A

Spike source expired? Levels D, E) ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: _____

Per FHI, use radiochemical field.

10. Duplicates (Levels C, D, E) ..... ☐ N/A

Duplicates Analyzed at required frequency? ..... Yes No N/A

RPD Values Acceptable? ..... Yes No N/A

Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A

Comments: RU-154 – 5070 J all

11. Field QC Samples (Levels C, D E) ..... ☐ N/A

Field duplicate sample(s) analyzed? ..... Yes No N/A

Field duplicate RPD values acceptable? ..... Yes No N/A

Field split sample(s) analyzed? ..... Yes No N/A

Field split RPD values acceptable? ..... Yes No N/A

Performance audit sample(s) analyzed? ..... Yes No N/A

Performance audit sample results acceptable? ..... Yes No N/A

Comments: NO FD, FS, or PAS

12. Holding Times (All levels)

Are sample holding times acceptable? ..... Yes No N/A

Comments:

13. Results and Detection Limits (All Levels) ☐ N/A

Results reported for all required sample analyses? Yes No N/A

Results supported in raw data?(Levels D, E) Yes No N/A

Results Acceptable? (Levels D, E) Yes No N/A

Transcription/Calculation errors? (Levels D, E) Yes No N/A

MDA's meet required detection limits? Yes No N/A

Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: ~~9+8+3~~ 5/4 ~~20 ...~~ 5/4/9

8+8+3 19 ...

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502192-04 **Method Blank**

METHOD BLANK

SDG	7252	Client/Case no	Hanford SDG H3046
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R502192-04	Client sample id	Method Blank
Dept sample id	7251-004	Material/Matrix	SOLID
		SAF No	F03-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-1.68	4.4	7.7	400	U	H
Carbon 14	14762-75-5	1.89	3.8	6.4	50	U	C
Nickel 63	13981-37-8	-1.14	1.9	3.3	30	U	NI_L
Total Strontium	SR-RAD	-0.101	0.13	0.31	1.0	U	SR
Technetium 99	14133-76-7	0.008	0.22	0.53	15	U	TC
Thorium 228	14274-82-9	N.A.					TH
Thorium 230	14269-63-7	N.A.			1.0		TH
Thorium 232	TH-232	N.A.			1.0		TH
Total Uranium (ug/g)	7440-61-1	0.007	0.004	0.008	1.0	U	U_T
Uranium 233/234	U-233/234	0	0.069	0.26	1.0	U	U
Uranium 235	15117-96-1	0	0.083	0.32	1.0	U	U
Uranium 238	U-238	0	0.069	0.26	1.0	U	U
Neptunium 237	13994-20-2	0	0.11	0.17	1.0	U	NP
Plutonium 238	13981-16-3	-0.032	0.065	0.25	1.0	U	PU
Plutonium 239/240	PU-239/240	0.032	0.065	0.25	1.0	U	PU
Americium 241	14596-10-2	0.057	0.11	0.22	1.0	U	AM
Potassium 40	13966-00-2	N.A.					GAM
Cobalt 60	10198-40-0	N.A.			0.050		GAM
Antimony 125	14234-35-6	N.A.					GAM
Cesium 134	13967-70-9	N.A.					GAM
Cesium 137	10045-97-3	N.A.			0.10		GAM
Radium 226	13982-63-3	N.A.					GAM
Radium 228	15262-20-1	N.A.					GAM
Europium 152	14683-23-9	N.A.			0.10		GAM
Europium 154	15585-10-1	N.A.			0.10		GAM
Europium 155	14391-16-3	N.A.			0.10		GAM
Thorium 228	14274-82-9	N.A.					GAM
Thorium 232	TH-232	N.A.					GAM
Uranium 235	15117-96-1	N.A.					GAM

200-LW-1/LW-2 Characterization-Soil

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/15/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502192-04 **Method Blank**

BLANK, cont.

SDG	7252	Client/Case no	Hanford	SDG H3046	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R502192-04	Client sample id	Method Blank		
Dept sample id	7251-004	Material/Matrix		SOLID	
		SAF No	F03-025		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 238	U-238	N.A.					GAM
Americium 241	14596-10-2	N.A.					GAM

200-LW-1/LW-2 Characterization-Soil

QC-BLANK 52120

METHOD BLANKS
Page 2
SUMMARY DATA SECTION
Page 10

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/15/05

00000014

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502208-05 Method Blank

METHOD BLANK

SDG	7252	Client/Case no	Hanford SDG H3046
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R502208-05	Client sample id	Method Blank
Dept sample id	7252-005	Material/Matrix	SOLID
		SAF No	F03-025

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Thorium 228	14274-82-9	-3.83	6.1	12		U	TH
Thorium 230	14269-63-7	15.3	25	49	1.0	U	TH
Thorium 232	TH-232	0	6.1	14	1.0	U	TH
Potassium 40	13966-00-2	U		5.2		U	GAM
Cobalt 60	10198-40-0	U		0.64	0.050	U	GAM
Antimony 125	14234-35-6	U		0.91		U	GAM
Cesium 134	13967-70-9	U		0.64		U	GAM
Cesium 137	10045-97-3	U		0.44	0.10	U	GAM
Radium 226	13982-63-3	U		0.85		U	GAM
Radium 228	15262-20-1	U		1.9		U	GAM
Europium 152	14683-23-9	U		1.1	0.10	U	GAM
Europium 154	15585-10-1	U		2.0	0.10	U	GAM
Europium 155	14391-16-3	U		0.56	0.10	U	GAM
Thorium 228	14274-82-9	U		0.44		U	GAM
Thorium 232	TH-232	U		1.9		U	GAM
Uranium 235	15117-96-1	U		1.1		U	GAM
Uranium 238	U-238	U		59		U	GAM
Americium 241	14596-10-2	U		0.31		U	GAM

200-LW-1/LW-2 Characterization-Soil

QC-BLANK 52200

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/15/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502192-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7252

Contact Melissa C. Mannion

Client/Case no Hanford SDG H3046

Contract No. 630

Lab sample id R502192-03

Dept sample id 7251-003

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No F03-025

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	1390	31	9.8	400		H	1460	58	95	84-116	80-120
Carbon 14	3210	65	15	50		C	3190	130	101	83-117	80-120
Nickel 63	257	8.2	4.2	30		NI_L	270	11	95	84-116	80-120
Total Strontium	11.3	0.64	0.27	1.0		SR	11.1	0.44	102	81-119	80-120
Technetium 99	118	2.8	0.59	15		TC	120	4.8	98	84-116	80-120
Thorium 230	N.A.			1.0		TH					80-120
Total Uranium (ug/g)	34.0	3.9	0.080	1.0		U_T	36.2	1.4	94	79-121	80-120
Uranium 233/234	20.9	2.3	1.0	1.0		U	19.3	0.77	108	79-121	80-120
Uranium 235	16.5	2.0	0.25	1.0		U	15.7	0.63	105	78-122	80-120
Uranium 238	20.7	2.3	0.98	1.0		U	21.0	0.84	99	81-119	80-120
Neptunium 237	19.6	3.1	0.38	1.0		NP	21.8	0.87	90	77-123	80-120
Plutonium 238	25.7	2.3	0.17	1.0		PU	26.4	1.1	97	84-116	80-120
Plutonium 239/240	29.0	2.5	0.17	1.0		PU	29.0	1.2	100	84-116	80-120
Americium 241	25.3	2.6	0.24	1.0		AM	22.4	0.90	113	80-120	80-120
Cobalt 60	N.A.			0.050		GAM					80-120
Cesium 137	N.A.			0.10		GAM					80-120

200-LW-1/LW-2 Characterization-Soil

QC-LCS 52119

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 04/15/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502208-04

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7252

Contact Melissa C. Mannion

Client/Case no Hanford SDG H3046

Contract No. 630

Lab sample id R502208-04

Dept sample id 7252-004

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No F03-025

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Thorium 230	10400	310	49	1.0		TH	10500	420	99	89-111	80-120
Cobalt 60	13.6	1.2	0.31	0.050		GAM	14.9	0.60	91	75-125	80-120
Cesium 137	15.0	1.0	0.70	0.10		GAM	14.8	0.59	101	74-126	80-120

200-LW-1/LW-2 Characterization-Soil

QC-LCS 52199

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 04/15/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502208-06 B19403

DUPLICATE

SDG	7252			Client/Case no	Hanford SDG H3046
Contact	Melissa C. Mannion			Contract	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R502208-06	Lab sample id	R502208-01	Client sample id	B19403
Dept sample id	7252-006	Dept sample id	7252-001	Location/Matrix	216-Z-7; SOLID
		Received	02/23/05	Collected/Weight	02/10/05 12:45 84 g
% solids	95.7	% solids	95.7	Custody/SAF No	F03-025-181 F03-025

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Tritium	-17.0	28	50	400	U	H	-23.6	37	66	U	-		
Carbon 14	-15.4	23	39	50	U	C	14.7	33	56	U	-		
Nickel 63	-108	150	260	30	U	NI_L	-14.2	96	160	U	-		
Total Strontium	32400	360	31	1.0		SR	34200	360	28		5	21	
Technetium 99	3.76	0.73	2.0	15		TC	11.0	1.1	2.1		98	36	
Thorium 228	-0.430	1.1	2.2		U	TH	0.711	1.4	2.0	U	-		
Thorium 230	1.43	4.9	9.9	1.0	U	TH	-1.56	4.5	9.7	U	-		
Thorium 232	-0.143	1.1	2.5	1.0	U	TH	0	1.1	2.5	U	-		
Total Uranium (ug/g)	5.30	0.58	0.080	1.0		U_T	5.06	0.55	0.080		5	30	
Uranium 233/234	0	5.3	20	1.0	U	U	2.82	5.7	22	U	-		
Uranium 235	6.45	6.5	25	1.0	U	U	0	6.8	26	U	-		
Uranium 238	2.66	5.3	20	1.0	U	U	8.48	11	22	U	-		
Neptunium 237	3.59	7.2	11	1.0	U	NP	0	7.0	11	U	-		
Plutonium 238	377	64	17	1.0		PU	388	64	17		3	37	
Plutonium 239/240	34700	2400	17	1.0		PU	33900	2300	17		2	18	
Americium 241	5500	460	21	1.0		AM	5340	480	25		3	21	
Potassium 40	17.9	7.8	5.9			GAM	14.0	5.4	4.5		24	95	
Cobalt 60	16.2	1.7	1.1	0.050		GAM	17.5	1.6	0.96		8	38	
Antimony 125	U		7.6		U	GAM	U		6.6	U	-		
Cesium 134	U		1.6		U	GAM	U		1.5	U	-		
Cesium 137	528	6.6	2.6	0.10		GAM	563	6.0	2.4		6	32	
Radium 226	U		3.5		U	GAM	U		3.1	U	-		
Radium 228	U		4.5		U	GAM	U		4.5	U	-		
Europium 152	U		7.7	0.10	U	GAM	U		6.3	U	-		
Europium 154	3.33	2.1	2.2	0.10		GAM	5.54	2.1	1.9		50	106	
Europium 155	U		12	0.10	U	GAM	U		9.4	U	-		
Thorium 228	U		3.7		U	GAM	U		3.3	U	-		
Thorium 232	U		4.5		U	GAM	U		4.5	U	-		

200-LW-1/LW-2 Characterization-Soil

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3046

R502208-06 B19403

DUPLICATE, cont.

SDG	7252			Client/Case no	Hanford SDG H3046
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R502208-06	Lab sample id	R502208-01	Client sample id	B19403
Dept sample id	7252-006	Dept sample id	7252-001	Location/Matrix	216-Z-7; SOLID
		Received	02/23/05	Collected/Weight	02/10/05 12:45 84 g
% solids	95.7	% solids	95.7	Custody/SAF No	F03-025-181 F03-025

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Uranium 235	U		12		U	GAM	U		11	U	-		
Uranium 238	U		140		U	GAM	U		130	U	-		
Americium 241	4240	19	13			GAM	4760	18	12		12	32	

200-LW-1/LW-2 Characterization-Soil

QC-DUP#1 52201

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	04/15/05