H1507

0057395

Date: 10 December 2001
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 100F Areas - Full Protocol - Waste Sites 100-F-19 and 116-F-14
Subject: Radiochemistry - Data Package No. H1507-TR (SDG No. H1507)

RECEIVED
JUN 10 2002
EDMC

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H1507-TR which was prepared by ThermoRetec (TR). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B12WV0	9/17/01	Soil	C	See note 1
B12WV1	9/17/01	Soil	C	See note 1
B12WV2	9/17/01	Soil	C	See note 1
B12WV3	9/17/01	Soil	C	See note 1
B12WV4	9/17/01	Soil	C	See note 1
B12WV5	9/17/01	Soil	C	See note 1
B12WV6	9/17/01	Soil	C	See note 1
B12WV7	9/17/01	Soil	C	See note 1
B12WV8	9/17/01	Soil	C	See note 1
B12WV9	9/17/01	Soil	C	See note 1
B12WW0	9/17/01	Soil	C	See note 1
B12WW1	9/17/01	Soil	C	See note 1
B12WW2	9/17/01	Soil	C	See note 1
B12WW3	9/17/01	Soil	C	See note 1
B12WW4	9/17/01	Soil	C	See note 1
B12WW5	9/17/01	Soil	C	See note 1
B12WW6	9/17/01	Soil	C	See note 1
B12XB5	9/18/01	Soil	C	See note 1
B12XB6	9/18/01	Soil	C	See note 1
B12XB7	9/18/01	Soil	C	See note 1

Sample ID	Sample Date	Media	Validation	Analysis
B12XB8	9/18/01	Soil	C	See note 1
B12XB9	9/18/01	Soil	C	See note 1
B12XC0	9/18/01	Soil	C	See note 1
B12XC1	9/18/01	Soil	C	See note 1
B12XC2	9/18/01	Soil	C	See note 1
B12XC3	9/18/01	Soil	C	See note 1
B12XC4	9/18/01	Soil	C	See note 1
B12XC5	9/18/01	Soil	C	See note 1
B12XC6	9/18/01	Soil	C	See note 1
B12XC7	9/18/01	Soil	C	See note 1

1 - Gamma spectroscopy; nickel-63; carbon-14; total strontium.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL September 2000). 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 Data Requested by Client

DATA QUALITY PARAMETERS

- **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.

- **Preparation (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 minimum detectable activity (MDA), 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 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 blank results were acceptable.

Field (Equipment) Blank

One field blank was submitted for analysis. Potassium-40, radium-226, radium-228, thorium-228 and throium-232 were detected in the equipment blank. Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is either 70-130% or ±3 sigma. 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, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% or ±3 sigma, tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

Due to the lack of a matrix spike analysis, all carbon-14 results were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

- **Laboratory Duplicates**

  Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the contract required detection limit (CRDL) and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

  All duplicate results were acceptable.

  Field Duplicate

  One set of field duplicates (B1WV5/B12WW6) was submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

  Reported analytical detection levels for undetected analytes are compared against the 100 Area Remedial Action Sampling and Analysis Plan target detection limits (TDLs) to ensure that laboratory detection levels meet the required criteria. The following analytes were reported above their TDL: 127 of 480 analytes exceeded their target detection limit. Under the BHI statement of work, no qualification is required. All other reported laboratory MDAs were at or below the analyte-specific TDL.

- **Completeness**

  Data package No. H1507-TR 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 a matrix spike analysis, all carbon-14 results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI 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.

127 of 480 analytes exceeded their target detection limit. Under the BHI statement of work, no qualification is required.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 2, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the BHI 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

DATA QUALIFICATION SUMMARY

SDG: H1507	REVIEWER: TLI	DATE: 12/10/01	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Carbon-14	J	All	No matrix spike analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																							
Laboratory: EB																							
Case	SDG: H1507																						
Sample Number		B12WV0		B12WV1		B12WV2		B12WV3		B12WV4		B12WV5		B12WV6		B12WV7		B12WV8		B12WV9			
Remarks																							
Location		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14			
Sample Date		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01			
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Carbon-14		2.17	UJ	5.28	J	1.22	UJ	5.72	J	5.71	J	4.95	UJ	6.04	J	3.22	UJ	2.98	UJ	1.85	UJ		
Nickel-63		1.77	U	341		11.0		94.0		502		17.0		827		53.7		23.5		137			
Strontium (total)	1	0.158	U	0.530		0.124		0.309		0.278		0.300		1.05		0.789		0.115	U	2.17			
Ruthenium-106		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A			
Potassium-40		16.8		36.8		14.8		16.6		18.4		14.4		43.2		18.6		16.2		16.4			
Cobalt 60	0.05	U*	U	6.98		0.238		2.62		4.23		0.531		19.4		1.34		0.525		1.82			
Cesium 137	0.05	4.70		7.52		4.09		2.08		12.9		9.06		8.54		4.51		6.10		4.55			
Radium-226		0.452		U	U	0.490		0.491		U	U	U	U	U	U	U	U	0.561		U	U		
Radium-228		0.626		U	U	0.890		U	U	U	U	U	U	U	U	0.530		0.580		0.662			
Europium 152	0.1	2.30		232		3.86		46.6		21.0		16.6		349		41.8		6.32		30.8			
Europium 154	0.1	U*	U	15.6		0.396		5.83		2.36		2.16		35.1		4.60		0.767		3.21			
Europium 155	0.1	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U		
Thorium-228		0.548		U	U	0.667		U	U	U	U	0.736		U	U	U	U	0.473		0.644			
Thorium-232		0.626		U	U	0.890		U	U	U	U	U	U	U	U	0.530		0.580		0.662			
Uranium-235	0.1	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U		
Uranium-238	0.1	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U		
Americium-241	0.1	U	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U	U		

* - TDL 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.

000071

Project: BECHTEL-HANFORD																					
Laboratory: EB																					
Case	SDG: H1507																				
Sample Number		12WW0		B12WW1		B12WW2		B12WW3		B12WW4		B12WW5		B12WW6		B12XB5		B12XB6		B12XB7	
Remarks												E. Blank		Duplicate							
Location		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		100-F-19		100-F-19		100-F-19	
Sample Date		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/18/01		9/18/01		9/18/01	
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Carbon-14		12.2	J	6.17	J	4.26	UJ	24.8	J	5.65	J	3.29	UJ	5.52	J	1.89	UJ	5.47	J	1.35	UJ
Nickel-63		269		64.2		10.9		1360		92.7		-0.626	U	22.0		0.157	U	0.321	U	0.104	U
Strontium (total)	1	1.29		0.519		1.39		2.66		0.117	U	0.003	U	0.291		0.014	U	0.007	U	-0.047	U
Ruthenium-106		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		U	U
Potassium-40		21.0		11.0		13.9		U	U	13.8		6.55		16.2		14.4		14.7		12.3	
Cobalt 60	0.05	4.48		U*	U	0.364		22.8		1.43		U	U	0.681		U*	U	U	U	U*	U
Cesium 137	0.05	6.42		9.24		0.460		8.67		6.08		U	U	10.1		U*	U	U	U	U	U
Radium-226		U	U	U	U	U	U	U	U	U	U	0.153		0.419		0.479		0.514		0.510	
Radium-228		U	U	U	U	0.675		U	U	U	U	0.189		0.483		0.742		0.876		0.607	
Europium 152	0.1	105		31.7		2.87		422		16.4		U	U	15.9		U*	U	U	U	U*	U
Europium 154	0.1	10.2		U*	U	U*	U	43.0		1.81		U*	U	2.15		U*	U	U*	U	U*	U
Europium 155	0.1	U*	U	U*	U	U*	U	U*	U	U*	U	U	U	U*	U	U	U	U	U	U*	U
Thorium-228		U	U	U	U	0.787		U	U	0.538		0.267		0.591		0.855		0.636		0.556	
Thorium-232		U	U	U	U	0.675		U	U	U	U	0.189		0.483		0.742		0.876		0.607	
Uranium-235	0.1	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U
Uranium-238	0.1	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U
Americium-241	0.1	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U	U	U*	U	U*	U

* - TDL 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.

Project: BECHTEL-HANFORD																					
Laboratory: EB																					
Case	SDG: H1507																				
Sample Number		B12XB8		B12XB9		B12XC0		B12XC1		B12XC2		B12XC3		B12XC4		B12XC5		B12XC6		B12XC7	
Remarks																					
Location		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19	
Sample Date		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01	
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Carbon-14		0.171	UJ	4.19	UJ	3.94	UJ	0.943	UJ	4.30	J	0.831	UJ	-0.176	UJ	3.49	UJ	-0.940	UJ	4.92	UJ
Nickel-63		0.316	U	0.230	U	0.277	U	0.469	U	1.11	U	0.208	U	1.72	U	0.557	U	0.636	U	-0.138	U
Strontium (total)	1	0.144	U	-0.094	U	0.032	U	0.060	U	-0.040	U	-0.054	U	0.009	U	0.032	U	0.108	U	0.081	U
Ruthenium-106		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A	
Potassium-40		12.8		14.9		17.4		18.5		14.9		14.2		11.2		13.4		13.4		13.5	
Cobalt 60	0.05	U	U	U	U	U	U	U	U	U	U	U*	U	U*	U	U*	U	U*	U	U	U
Cesium 137	0.05	0.043		U	U	U	U	0.040		U	U	U	U	U*	U	U*	U	0.041	U	U	U
Radium-226		0.469		0.445		U	U	U	U	0.420		0.483		0.500		0.553		0.420		0.450	
Radium-228		0.622		0.782		0.749		0.807		0.618		0.812		0.632		0.792		0.745		0.708	
Europium 152	0.1	U	U	U	U	U	U	U	U	U	U	U	U	U*	U	U*	U	N/A		U	U
Europium 154	0.1	U	U	U*	U	U	U	U*	U	U	U	U*	U	U*	U	U*	U	U*	U	U*	U
Europium 155	0.05	U	U	U	U	U	U	U	U	U	U	U	U	U*	U	U*	U	U*	U	U	U
Thorium-228		0.609		0.570		0.715		0.743		0.556		0.566		0.549		0.835		0.714		0.652	
Thorium-232		0.622		0.782		0.749		0.807		0.618		0.812		0.632		0.792		0.745		0.708	
Uranium-235	0.1	U*	U	U*	U	U	U	U*	U	U	U	U*	U	U*	U	U*	U	U*	U	U*	U
Uranium-238	0.1	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U
Americium-241	0.1	U	U	U*	U	U	U	U	U	U	U	U	U	U*	U	U	U	U*	U	U	U

* - TDL 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 H1507

R109115-01

B12WV0

DATA SHEET

SDG	7084	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109115-01	Client sample id	B12WV0		
Dept sample id	7084-001	Location/Matrix	116-F-14	SOLID	
Received	09/20/01	Collected/Weight	09/17/01 09:25	1374 g	
% solids	99.8	Custody/SAF No	B00-030-22	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	2.17	3.0	4.9	50	U J	C
Nickel 63	13981-37-8	1.77	1.3	2.2	30	U	NI_L
Total Strontium	SR-RAD	0.158	0.13	0.23	1.0	U	SR
Potassium 40	13966-00-2	16.8	1.0	0.61			GAM
Cobalt 60	10198-40-0	U		0.062	0.050	U	GAM
Cesium 137	10045-97-3	4.70	0.13	0.074	0.10		GAM
Radium 226	13982-63-3	0.452	0.10	0.11	0.10		GAM
Radium 228	15262-20-1	0.626	0.21	0.24	0.20		GAM
Europium 152	14683-23-9	2.30	0.14	0.15	0.10		GAM
Europium 154	15585-10-1	U		0.22	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Thorium 228	14274-82-9	0.548	0.057	0.073			GAM
Thorium 232	TH-232	0.626	0.21	0.24			GAM
Uranium 235	15117-96-1	U		0.19		U	GAM
Uranium 238	U-238	U		8.1		U	GAM
Americium 241	14596-10-2	U		0.076		U	GAM

100 F Area - Full Protocol

12/4/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-02

B12WV1

DATA SHEET

SDG	7084	Client/Case no	Hanford SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109115-02	Client sample id	B12WV1
Dept sample id	7084-002	Location/Matrix	116-F-14 SOLID
Received	09/20/01	Collected/Weight	09/17/01 09:30 1546 g
% solids	99.6	Custody/SAF No	B00-030-22 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	5.28	3.0	4.8	50	~~U~~ J	C
Nickel 63	13981-37-8	341	5.6	2.3	30		NI_L
Total Strontium	SR-RAD	0.530	0.16	0.21	1.0	~~U~~	SR
Potassium 40	13966-00-2	36.8	1.4	0.95			GAM
Cobalt 60	10198-40-0	6.98	0.18	0.14	0.050		GAM
Cesium 137	10045-97-3	7.52	0.20	0.24	0.10		GAM
Radium 226	13982-63-3	U		0.37	0.10	U	GAM
Radium 228	15262-20-1	U		0.91	0.20	U	GAM
Europium 152	14683-23-9	232	1.0	0.71	0.10		GAM
Europium 154	15585-10-1	15.6	0.66	0.62	0.10		GAM
Europium 155	14391-16-3	U		0.53	0.10	U	GAM
Thorium 228	14274-82-9	U		0.69		U	GAM
Thorium 232	TH-232	U		0.91		U	GAM
Uranium 235	15117-96-1	U		0.68		U	GAM
Uranium 238	U-238	U		33		U	GAM
Americium 241	14596-10-2	U		0.34		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-03

B12WV2

DATA SHEET

SDG	7084	Client/Case no	Hanford SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109115-03	Client sample id	B12WV2
Dept sample id	7084-003	Location/Matrix	116-F-14 SOLID
Received	09/20/01	Collected/Weight	09/17/01 08:10 1281 g
% solids	99.8	Custody/SAF No	B00-030-22 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	1.22	2.7	4.5	50	U J	C
Nickel 63	13981-37-8	11.0	1.6	2.1	30		NI_L
Total Strontium	SR-RAD	0.124	0.11	0.21	1.0	U	SR
Potassium 40	13966-00-2	14.8	1.2	0.70			GAM
Cobalt 60	10198-40-0	0.238	0.066	0.062	0.050		GAM
Cesium 137	10045-97-3	4.09	0.16	0.12	0.10		GAM
Radium 226	13982-63-3	0.490	0.17	0.18	0.10		GAM
Radium 228	15262-20-1	0.890	0.39	0.40	0.20		GAM
Europium 152	14683-23-9	3.86	0.28	0.29	0.10		GAM
Europium 154	15585-10-1	0.396	0.27	0.28	0.10		GAM
Europium 155	14391-16-3	U		0.22	0.10	U	GAM
Thorium 228	14274-82-9	0.667	0.068	0.092			GAM
Thorium 232	TH-232	0.890	0.39	0.40			GAM
Uranium 235	15117-96-1	U		0.31		U	GAM
Uranium 238	U-238	U		10		U	GAM
Americium 241	14596-10-2	U		0.28		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-04

B12WV3

DATA SHEET

SDG	7084	Client/Case no	Hanford — SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109115-04	Client sample id	B12WV3
Dept sample id	7084-004	Location/Matrix	116-F-14 — SOLID
Received	09/20/01	Collected/Weight	09/17/01 09:35 — 1449 g
% solids	99.5	Custody/SAF No	B00-030-22 — B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	5.72	3.0	4.8	50	~~U~~ J	C
Nickel 63	13981-37-8	94.0	3.3	2.4	30		NI_L
Total Strontium	SR-RAD	0.309	0.13	0.21	1.0	~~J~~	SR
Potassium 40	13966-00-2	16.6	0.65	0.38			GAM
Cobalt 60	10198-40-0	2.62	0.099	0.068	0.050		GAM
Cesium 137	10045-97-3	2.08	0.11	0.12	0.10		GAM
Radium 226	13982-63-3	0.491	0.13	0.17	0.10		GAM
Radium 228	15262-20-1	U		0.73	0.20	U	GAM
Europium 152	14683-23-9	46.6	0.37	0.27	0.10		GAM
Europium 154	15585-10-1	5.83	0.28	0.24	0.10		GAM
Europium 155	14391-16-3	U		0.35	0.10	U	GAM
Thorium 228	14274-82-9	U		0.73		U	GAM
Thorium 232	TH-232	U		0.73		U	GAM
Uranium 235	15117-96-1	U		0.39		U	GAM
Uranium 238	U-238	U		15		U	GAM
Americium 241	14596-10-2	U		0.33		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-05

B12WV4

DATA SHEET

SDG	7084	Client/Case no	Hanford SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109115-05	Client sample id	B12WV4
Dept sample id	7084-005	Location/Matrix	116-F-14 SOLID
Received	09/20/01	Collected/Weight	09/17/01 09:47 1378 g
% solids	99.8	Custody/SAF No	B00-030-22 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	5.71	3.3	5.3	50	~~J~~	C
Nickel 63	13981-37-8	502	6.2	2.0	30		NI_L
Total Strontium	SR-RAD	0.278	0.13	0.20	1.0	~~J~~	SR
Potassium 40	13966-00-2	18.4	0.98	0.47			GAM
Cobalt 60	10198-40-0	4.23	0.15	0.078	0.050		GAM
Cesium 137	10045-97-3	12.9	0.19	0.11	0.10		GAM
Radium 226	13982-63-3	U		0.62	0.10	U	GAM
Radium 228	15262-20-1	U		0.86	0.20	U	GAM
Europium 152	14683-23-9	21.0	0.36	0.27	0.10		GAM
Europium 154	15585-10-1	2.36	0.30	0.29	0.10		GAM
Europium 155	14391-16-3	U		0.38	0.10	U	GAM
Thorium 228	14274-82-9	U		0.57		U	GAM
Thorium 232	TH-232	U		0.86		U	GAM
Uranium 235	15117-96-1	U		0.41		U	GAM
Uranium 238	U-238	U		17		U	GAM
Americium 241	14596-10-2	U		0.87		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-06

B12WV5

DATA SHEET

SDG	7084	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109115-06	Client sample id	B12WV5		
Dept sample id	7084-006	Location/Matrix	116-F-14	SOLID	
Received	09/20/01	Collected/Weight	09/17/01 08:20	1432 g	
% solids	99.6	Custody/SAF No	B00-030-22	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	4.95	3.1	5.0	50	U J	C
Nickel 63	13981-37-8	17.0	1.7	2.1	30	~~U~~	NI_L
Total Strontium	SR-RAD	0.300	0.13	0.21	1.0	~~U~~	SR
Potassium 40	13966-00-2	14.4	1.1	0.69			GAM
Cobalt 60	10198-40-0	0.531	0.094	0.088	0.050		GAM
Cesium 137	10045-97-3	9.06	0.22	0.17	0.10		GAM
Radium 226	13982-63-3	U		0.56	0.10	U	GAM
Radium 228	15262-20-1	U		0.61	0.20	U	GAM
Europium 152	14683-23-9	16.6	0.44	0.41	0.10		GAM
Europium 154	15585-10-1	2.16	0.37	0.36	0.10		GAM
Europium 155	14391-16-3	U		0.33	0.10	U	GAM
Thorium 228	14274-82-9	0.736	0.13	0.17			GAM
Thorium 232	TH-232	U		0.61		U	GAM
Uranium 235	15117-96-1	U		0.44		U	GAM
Uranium 238	U-238	U		16		U	GAM
Americium 241	14596-10-2	U		0.39		U	GAM

100 F Area - Full Protocol

RC 12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-07

B12WV6

DATA SHEET

SDG	7084	Client/Case no	Hanford		SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109115-07	Client sample id	B12WV6		
Dept sample id	7084-007	Location/Matrix	116-F-14		SOLID
Received	09/20/01	Collected/Weight	09/17/01 09:40	1525 g	
% solids	99.5	Custody/SAF No	B00-030-22	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	6.04	3.0	4.9	50	~~J~~ J	C
Nickel 63	13981-37-8	827	8.4	2.1	30		NI_L
Total Strontium	SR-RAD	1.05	0.19	0.20	1.0		SR
Potassium 40	13966-00-2	43.2	1.5	1.1			GAM
Cobalt 60	10198-40-0	19.4	0.26	0.18	0.050		GAM
Cesium 137	10045-97-3	8.54	0.20	0.25	0.10		GAM
Radium 226	13982-63-3	U		0.42	0.10	U	GAM
Radium 228	15262-20-1	U		1.1	0.20	U	GAM
Europium 152	14683-23-9	349	1.1	0.72	0.10		GAM
Europium 154	15585-10-1	35.1	0.80	0.71	0.10		GAM
Europium 155	14391-16-3	U		1.0	0.10	U	GAM
Thorium 228	14274-82-9	U		0.96		U	GAM
Thorium 232	TH-232	U		1.1		U	GAM
Uranium 235	15117-96-1	U		0.76		U	GAM
Uranium 238	U-238	U		39		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM

100 F Area - Full Protocol

pr
12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-08

B12WV7

DATA SHEET

SDG	7084	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109115-08	Client sample id	B12WV7		
Dept sample id	7084-008	Location/Matrix	116-F-14	SOLID	
Received	09/20/01	Collected/Weight	09/17/01 09:50	1358 g	
% solids	99.7	Custody/SAF No	B00-030-22	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	3.22	2.9	4.7	50	U J	C
Nickel 63	13981-37-8	53.7	2.5	2.3	30		NI_L
Total Strontium	SR-RAD	0.789	0.18	0.22	1.0	~~J~~	SR
Potassium 40	13966-00-2	18.6	0.94	0.51			GAM
Cobalt 60	10198-40-0	1.34	0.10	0.084	0.050		GAM
Cesium 137	10045-97-3	4.51	0.15	0.15	0.10		GAM
Radium 226	13982-63-3	U		0.68	0.10	U	GAM
Radium 228	15262-20-1	0.530	0.37	0.50	0.20		GAM
Europium 152	14683-23-9	41.8	0.54	0.42	0.10		GAM
Europium 154	15585-10-1	4.60	0.37	0.32	0.10		GAM
Europium 155	14391-16-3	U		0.42	0.10	U	GAM
Thorium 228	14274-82-9	U		0.64		U	GAM
Thorium 232	TH-232	0.530	0.37	0.50			GAM
Uranium 235	15117-96-1	U		0.43		U	GAM
Uranium 238	U-238	U		18		U	GAM
Americium 241	14596-10-2	U		0.91		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-09 B12WV8

DATA SHEET

SDG	7084	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109115-09	Client sample id	B12WV8		
Dept sample id	7084-009	Location/Matrix	116-F-14	SOLID	
Received	09/20/01	Collected/Weight	09/17/01 08:40	1448 g	
% solids	99.7	Custody/SAF No	B00-030-22	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	2.98	2.9	4.8	50	U J	C
Nickel 63	13981-37-8	23.5	1.8	2.1	30		NI_L
Total Strontium	SR-RAD	0.115	0.12	0.22	1.0	U	SR
Potassium 40	13966-00-2	16.2	0.86	0.39			GAM
Cobalt 60	10198-40-0	0.525	0.060	0.052	0.050		GAM
Cesium 137	10045-97-3	6.10	0.14	0.087	0.10		GAM
Radium 226	13982-63-3	0.561	0.12	0.14	0.10		GAM
Radium 228	15262-20-1	0.580	0.20	0.25	0.20		GAM
Europium 152	14683-23-9	6.32	0.18	0.15	0.10		GAM
Europium 154	15585-10-1	0.767	0.15	0.15	0.10		GAM
Europium 155	14391-16-3	U		0.23	0.10	U	GAM
Thorium 228	14274-82-9	0.473	0.048	0.069			GAM
Thorium 232	TH-232	0.580	0.20	0.25			GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		9.0		U	GAM
Americium 241	14596-10-2	U		0.52		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-10 B12WV9

DATA SHEET

SDG	7084	Client/Case no	Hanford SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109115-10	Client sample id	B12WV9
Dept sample id	7084-010	Location/Matrix	116-F-14 SOLID
Received	09/20/01	Collected/Weight	09/17/01 09:10 1469 g
% solids	99.5	Custody/SAF No	B00-030-22 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	1.85	2.6	4.3	50	U J	C
Nickel 63	13981-37-8	137	3.5	2.2	30		NI_L
Total Strontium	SR-RAD	2.17	0.26	0.22	1.0		SR
Potassium 40	13966-00-2	16.4	0.93	0.47			GAM
Cobalt 60	10198-40-0	1.82	0.088	0.062	0.050		GAM
Cesium 137	10045-97-3	4.55	0.12	0.11	0.10		GAM
Radium 226	13982-63-3	U		0.16	0.10	U	GAM
Radium 228	15262-20-1	0.662	0.28	0.36	0.20		GAM
Europium 152	14683-23-9	30.8	0.30	0.17	0.10		GAM
Europium 154	15585-10-1	3.21	0.24	0.22	0.10		GAM
Europium 155	14391-16-3	U		0.20	0.10	U	GAM
Thorium 228	14274-82-9	0.644	0.072	0.10			GAM
Thorium 232	TH-232	0.662	0.28	0.36			GAM
Uranium 235	15117-96-1	U		0.26		U	GAM
Uranium 238	U-238	U		12		U	GAM
Americium 241	14596-10-2	U		0.085		U	GAM

100 F Area - Full Protocol

JLW
12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-11

B12WW0

DATA SHEET

SDG	7084	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109115-11	Client sample id	B12WW0		
Dept sample id	7084-011	Location/Matrix	116-F-14	SOLID	
Received	09/20/01	Collected/Weight	09/17/01 09:45	1421 g	
% solids	99.5	Custody/SAF No	B00-030-22	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	12.2	2.8	4.2	50	~~U~~ J	C
Nickel 63	13981-37-8	269	5.0	2.3	30		NI_L
Total Strontium	SR-RAD	1.29	0.21	0.21	1.0		SR
Potassium 40	13966-00-2	21.0	1.3	0.72			GAM
Cobalt 60	10198-40-0	4.48	0.22	0.16	0.050		GAM
Cesium 137	10045-97-3	6.42	0.28	0.30	0.10		GAM
Radium 226	13982-63-3	U		0.60	0.10	U	GAM
Radium 228	15262-20-1	U		1.2	0.20	U	GAM
Europium 152	14683-23-9	105	1.0	0.75	0.10		GAM
Europium 154	15585-10-1	10.2	0.87	0.73	0.10		GAM
Europium 155	14391-16-3	U		0.55	0.10	U	GAM
Thorium 228	14274-82-9	U		0.90		U	GAM
Thorium 232	TH-232	U		1.2		U	GAM
Uranium 235	15117-96-1	U		0.78		U	GAM
Uranium 238	U-238	U		43		U	GAM
Americium 241	14596-10-2	U		0.27		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-12 B12WW1

DATA SHEET

SDG	7084	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109115-12	Client sample id	B12WW1		
Dept sample id	7084-012	Location/Matrix	116-F-14	SOLID	
Received	09/20/01	Collected/Weight	09/17/01 08:30	1496 g	
% solids	99.5	Custody/SAF No	B00-030-22	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	6.17	3.3	5.3	50	J	C
Nickel 63	13981-37-8	64.2	2.6	2.2	30		NI_L
Total Strontium	SR-RAD	0.519	0.16	0.22	1.0		SR
Potassium 40	13966-00-2	11.0	1.6	1.3			GAM
Cobalt 60	10198-40-0	U		0.22	0.050	U	GAM
Cesium 137	10045-97-3	9.24	0.33	0.27	0.10		GAM
Radium 226	13982-63-3	U		0.68	0.10	U	GAM
Radium 228	15262-20-1	U		0.79	0.20	U	GAM
Europium 152	14683-23-9	31.7	0.56	0.45	0.10		GAM
Europium 154	15585-10-1	U		0.66	0.10	U	GAM
Europium 155	14391-16-3	U		0.37	0.10	U	GAM
Thorium 228	14274-82-9	U		0.71		U	GAM
Thorium 232	TH-232	U		0.79		U	GAM
Uranium 235	15117-96-1	U		0.54		U	GAM
Uranium 238	U-238	U		28		U	GAM
Americium 241	14596-10-2	U		0.19		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-13 B12WW2

DATA SHEET

SDG	7084	Client/Case no	Hanford SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109115-13	Client sample id	B12WW2
Dept sample id	7084-013	Location/Matrix	116-F-14 SOLID
Received	09/20/01	Collected/Weight	09/17/01 09:15 1515 g
% solids	99.3	Custody/SAF No	B00-030-22 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	4.26	3.1	5.0	50	U J	C
Nickel 63	13981-37-8	10.9	1.6	2.2	30	~~J~~	NI_L
Total Strontium	SR-RAD	1.39	0.22	0.21	1.0		SR
Potassium 40	13966-00-2	13.9	1.1	0.72			GAM
Cobalt 60	10198-40-0	0.364	0.077	0.070	0.050		GAM
Cesium 137	10045-97-3	0.460	0.083	0.085	0.10		GAM
Radium 226	13982-63-3	U		0.59	0.10	U	GAM
Radium 228	15262-20-1	0.675	0.23	0.27	0.20		GAM
Europium 152	14683-23-9	2.87	0.16	0.16	0.10		GAM
Europium 154	15585-10-1	U		0.43	0.10	U	GAM
Europium 155	14391-16-3	U		0.18	0.10	U	GAM
Thorium 228	14274-82-9	0.787	0.072	0.084			GAM
Thorium 232	TH-232	0.675	0.23	0.27			GAM
Uranium 235	15117-96-1	U		0.25		U	GAM
Uranium 238	U-238	U		8.8		U	GAM
Americium 241	14596-10-2	U		0.24		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-14

B12WW3

DATA SHEET

SDG	7084	Client/Case no	Hanford SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109115-14	Client sample id	B12WW3
Dept sample id	7084-014	Location/Matrix	116-F-14 SOLID
Received	09/20/01	Collected/Weight	09/17/01 09:05 1619 g
% solids	99.4	Custody/SAF No	B00-030-22 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	24.8	3.4	4.9	50	~~B~~ J	C
Nickel 63	13981-37-8	1360	14	2.9	30		NI_L
Total Strontium	SR-RAD	2.66	0.28	0.21	1.0		SR
Potassium 40	13966-00-2	U		2.2		U	GAM
Cobalt 60	10198-40-0	22.8	0.30	0.20	0.050		GAM
Cesium 137	10045-97-3	8.67	0.38	0.42	0.10		GAM
Radium 226	13982-63-3	U		0.98	0.10	U	GAM
Radium 228	15262-20-1	U		1.3	0.20	U	GAM
Europium 152	14683-23-9	422	1.3	0.94	0.10		GAM
Europium 154	15585-10-1	43.0	0.93	0.80	0.10		GAM
Europium 155	14391-16-3	U		1.8	0.10	U	GAM
Thorium 228	14274-82-9	U		0.75		U	GAM
Thorium 232	TH-232	U		1.3		U	GAM
Uranium 235	15117-96-1	U		1.2		U	GAM
Uranium 238	U-238	U		48		U	GAM
Americium 241	14596-10-2	U		1.0		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-15

B12WW4

DATA SHEET

SDG	7084	Client/Case no	Hanford — SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109115-15	Client sample id	B12WW4
Dept sample id	7084-015	Location/Matrix	116-F-14 — SOLID
Received	09/20/01	Collected/Weight	09/17/01 08:45 — 1362 g
% solids	99.6	Custody/SAF No	B00-030-22 — B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	5.65	3.1	5.0	50	~~J~~	C
Nickel 63	13981-37-8	92.7	3.0	2.2	30		NI_L
Total Strontium	SR-RAD	0.117	0.11	0.20	1.0	U	SR
Potassium 40	13966-00-2	13.8	1.1	0.59			GAM
Cobalt 60	10198-40-0	1.43	0.14	0.10	0.050		GAM
Cesium 137	10045-97-3	6.08	0.21	0.16	0.10		GAM
Radium 226	13982-63-3	U		0.63	0.10	U	GAM
Radium 228	15262-20-1	U		0.88	0.20	U	GAM
Europium 152	14683-23-9	16.4	0.40	0.32	0.10		GAM
Europium 154	15585-10-1	1.81	0.34	0.31	0.10		GAM
Europium 155	14391-16-3	U		0.24	0.10	U	GAM
Thorium 228	14274-82-9	0.538	0.11	0.15			GAM
Thorium 232	TH-232	U		0.88		U	GAM
Uranium 235	15117-96-1	U		0.36		U	GAM
Uranium 238	U-238	U		20		U	GAM
Americium 241	14596-10-2	U		0.13		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-16 B12WW5

DATA SHEET

SDG	7084	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109115-16	Client sample id	B12WW5		
Dept sample id	7084-016	Location/Matrix	116-F-14	SOLID	
Received	09/20/01	Collected/Weight	09/17/01 07:35	1468 g	
% solids	100.0	Custody/SAF No	B00-030-22	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	3.29	2.9	4.7	50	U J	C
Nickel 63	13981-37-8	-0.626	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	0.003	0.11	0.22	1.0	U	SR
Potassium 40	13966-00-2	6.55	0.72	0.39			GAM
Cobalt 60	10198-40-0	U		0.040	0.050	U	GAM
Cesium 137	10045-97-3	U		0.034	0.10	U	GAM
Radium 226	13982-63-3	0.153	0.058	0.061	0.10		GAM
Radium 228	15262-20-1	0.189	0.14	0.15	0.20		GAM
Europium 152	14683-23-9	U		0.080	0.10	U	GAM
Europium 154	15585-10-1	U		0.14	0.10	U	GAM
Europium 155	14391-16-3	U		0.083	0.10	U	GAM
Thorium 228	14274-82-9	0.267	0.051	0.052			GAM
Thorium 232	TH-232	0.189	0.14	0.15			GAM
Uranium 235	15117-96-1	U		0.13		U	GAM
Uranium 238	U-238	U		4.1		U	GAM
Americium 241	14596-10-2	U		0.13		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-17 B12WW6

DATA SHEET

SDG	7084	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109115-17	Client sample id	B12WW6		
Dept sample id	7084-017	Location/Matrix	116-F-14	SOLID	
Received	09/20/01	Collected/Weight	09/17/01 08:20	1402 g	
% solids	99.6	Custody/SAF No	B00-030-22	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	5.52	3.0	4.8	50	~~U~~ J	C
Nickel 63	13981-37-8	22.0	1.9	2.2	30	~~U~~	NI_L
Total Strontium	SR-RAD	0.291	0.12	0.18	1.0	~~U~~	SR
Potassium 40	13966-00-2	16.2	0.69	0.34			GAM
Cobalt 60	10198-40-0	0.681	0.062	0.048	0.050		GAM
Cesium 137	10045-97-3	10.1	0.15	0.093	0.10		GAM
Radium 226	13982-63-3	0.419	0.12	0.14	0.10		GAM
Radium 228	15262-20-1	0.483	0.22	0.28	0.20		GAM
Europium 152	14683-23-9	15.9	0.25	0.18	0.10		GAM
Europium 154	15585-10-1	2.15	0.22	0.20	0.10		GAM
Europium 155	14391-16-3	U		0.26	0.10	U	GAM
Thorium 228	14274-82-9	0.591	0.075	0.10			GAM
Thorium 232	TH-232	0.483	0.22	0.28			GAM
Uranium 235	15117-96-1	U		0.31		U	GAM
Uranium 238	U-238	U		11		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM

100 F Area - Full Protocol

12/19/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-01

B12XB5

DATA SHEET

SDG	7083	Client/Case no	Hanford SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109114-01	Client sample id	B12XB5
Dept sample id	7083-001	Location/Matrix	100-F-19 SOLID
Received	09/20/01	Collected/Weight	09/18/01 09:40 1537 g
% solids	99.4	Custody/SAF No	B00-030-25 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	1.89	2.0	3.4	50	U J	C
Nickel 63	13981-37-8	0.157	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	0.014	0.14	0.29	1.0	U	SR
Potassium 40	13966-00-2	14.4	1.1	0.51			GAM
Cobalt 60	10198-40-0	U		0.066	0.050	U	GAM
Cesium 137	10045-97-3	U		0.052	0.10	U	GAM
Radium 226	13982-63-3	0.479	0.11	0.10	0.10		GAM
Radium 228	15262-20-1	0.742	0.24	0.24	0.20		GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	U		0.20	0.10	U	GAM
Europium 155	14391-16-3	U		0.087	0.10	U	GAM
Thorium 228	14274-82-9	0.855	0.082	0.075			GAM
Thorium 232	TH-232	0.742	0.24	0.24			GAM
Uranium 235	15117-96-1	U		0.16		U	GAM
Uranium 238	U-238	U		6.7		U	GAM
Americium 241	14596-10-2	U		0.060		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-02 B12XB6

DATA SHEET

SDG	7083	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109114-02	Client sample id	B12XB6		
Dept sample id	7083-002	Location/Matrix	100-F-19	SOLID	
Received	09/20/01	Collected/Weight	09/18/01 09:35	1427 g	
% solids	99.4	Custody/SAF No	B00-030-25	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	5.47	2.9	4.7	50	~~U~~ J	C
Nickel 63	13981-37-8	0.321	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	0.007	0.14	0.30	1.0	U	SR
Potassium 40	13966-00-2	14.7	0.72	0.27			GAM
Cobalt 60	10198-40-0	U		0.034	0.050	U	GAM
Cesium 137	10045-97-3	U		0.031	0.10	U	GAM
Radium 226	13982-63-3	0.514	0.060	0.055	0.10		GAM
Radium 228	15262-20-1	0.876	0.14	0.13	0.20		GAM
Europium 152	14683-23-9	U		0.072	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.079	0.10	U	GAM
Thorium 228	14274-82-9	0.636	0.037	0.035			GAM
Thorium 232	TH-232	0.876	0.14	0.13			GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		3.8		U	GAM
Americium 241	14596-10-2	U		0.15		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-03 B12XB7

DATA SHEET

SDG	7083	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109114-03	Client sample id	B12XB7		
Dept sample id	7083-003	Location/Matrix	100-F-19	SOLID	
Received	09/20/01	Collected/Weight	09/18/01 09:30	1413 g	
% solids	99.5	Custody/SAF No	B00-030-25	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	1.35	2.2	3.7	50	U J	C
Nickel 63	13981-37-8	0.104	1.1	1.9	30	U	NI_L
Total Strontium	SR-RAD	-0.047	0.13	0.28	1.0	U	SR
Ruthenium 106	13967-48-1	U		0.38		U	GAM
Potassium 40	13966-00-2	12.3	1.0	0.68			GAM
Cobalt 60	10198-40-0	U		0.053	0.050	U	GAM
Cesium 137	10045-97-3	U		0.049	0.10	U	GAM
Radium 226	13982-63-3	0.510	0.11	0.10	0.10		GAM
Radium 228	15262-20-1	0.607	0.26	0.25	0.20		GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.18	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Thorium 228	14274-82-9	0.556	0.056	0.061			GAM
Thorium 232	TH-232	0.607	0.26	0.25			GAM
Uranium 235	15117-96-1	U		0.19		U	GAM
Uranium 238	U-238	U		5.7		U	GAM
Americium 241	14596-10-2	U		0.13		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-04 B12XB8

DATA SHEET

SDG	7083	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109114-04	Client sample id	B12XB8		
Dept sample id	7083-004	Location/Matrix	100-F-19	SOLID	
Received	09/20/01	Collected/Weight	09/18/01 09:25	1407 g	
% solids	98.9	Custody/SAF No	B00-030-25	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.171	2.4	4.1	50	U J	C
Nickel 63	13981-37-8	0.316	1.1	1.9	30	U	NI_L
Total Strontium	SR-RAD	0.144	0.16	0.29	1.0	U	SR
Potassium 40	13966-00-2	12.8	0.62	0.28			GAM
Cobalt 60	10198-40-0	U		0.028	0.050	U	GAM
Cesium 137	10045-97-3	0.043	0.026	0.028	0.10		GAM
Radium 226	13982-63-3	0.469	0.051	0.044	0.10		GAM
Radium 228	15262-20-1	0.622	0.12	0.12	0.20		GAM
Europium 152	14683-23-9	U		0.065	0.10	U	GAM
Europium 154	15585-10-1	U		0.10	0.10	U	GAM
Europium 155	14391-16-3	U		0.074	0.10	U	GAM
Thorium 228	14274-82-9	0.609	0.036	0.034			GAM
Thorium 232	TH-232	0.622	0.12	0.12			GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		3.2		U	GAM
Americium 241	14596-10-2	U		0.073		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-05

B12XB9

DATA SHEET

SDG	7083	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109114-05	Client sample id	B12XB9		
Dept sample id	7083-005	Location/Matrix	100-F-19	SOLID	
Received	09/20/01	Collected/Weight	09/18/01 09:00	1477 g	
% solids	99.4	Custody/SAF No	B00-030-25	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	4.19	2.7	4.4	50	U J	C
Nickel 63	13981-37-8	0.230	1.1	1.9	30	U	NI_L
Total Strontium	SR-RAD	-0.094	0.12	0.28	1.0	U	SR
Potassium 40	13966-00-2	14.9	0.78	0.30			GAM
Cobalt 60	10198-40-0	U		0.034	0.050	U	GAM
Cesium 137	10045-97-3	U		0.034	0.10	U	GAM
Radium 226	13982-63-3	0.445	0.056	0.050	0.10		GAM
Radium 228	15262-20-1	0.782	0.17	0.16	0.20		GAM
Europium 152	14683-23-9	U		0.076	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.085	0.10	U	GAM
Thorium 228	14274-82-9	0.570	0.038	0.037			GAM
Thorium 232	TH-232	0.782	0.17	0.16			GAM
Uranium 235	15117-96-1	U		0.13		U	GAM
Uranium 238	U-238	U		4.2		U	GAM
Americium 241	14596-10-2	U		0.15		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-06

B12XC0

DATA SHEET

SDG	7083	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109114-06	Client sample id	B12XC0		
Dept sample id	7083-006	Location/Matrix	100-F-19	SOLID	
Received	09/20/01	Collected/Weight	09/18/01 08:55	1452 g	
% solids	99.1	Custody/SAF No	B00-030-25	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	3.94	2.8	4.5	50	U J	C
Nickel 63	13981-37-8	0.277	1.1	1.9	30	U	NI_L
Total Strontium	SR-RAD	0.032	0.15	0.30	1.0	U	SR
Potassium 40	13966-00-2	17.4	0.89	0.32			GAM
Cobalt 60	10198-40-0	U		0.029	0.050	U	GAM
Cesium 137	10045-97-3	U		0.027	0.10	U	GAM
Radium 226	13982-63-3	U		0.094	0.10	U	GAM
Radium 228	15262-20-1	0.749	0.14	0.13	0.20		GAM
Europium 152	14683-23-9	U		0.063	0.10	U	GAM
Europium 154	15585-10-1	U		0.10	0.10	U	GAM
Europium 155	14391-16-3	U		0.059	0.10	U	GAM
Thorium 228	14274-82-9	0.715	0.039	0.035			GAM
Thorium 232	TH-232	0.749	0.14	0.13			GAM
Uranium 235	15117-96-1	U		0.098		U	GAM
Uranium 238	U-238	U		3.3		U	GAM
Americium 241	14596-10-2	U		0.034		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-07

B12XC1

DATA SHEET

SDG	7083	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109114-07	Client sample id	B12XC1		
Dept sample id	7083-007	Location/Matrix	100-F-19	SOLID	
Received	09/20/01	Collected/Weight	09/18/01 08:50	1514 g	
% solids	99.5	Custody/SAF No	B00-030-25	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.943	2.5	4.2	50	U J	C
Nickel 63	13981-37-8	0.469	1.1	1.9	30	U	NI_L
Total Strontium	SR-RAD	0.060	0.15	0.29	1.0	U	SR
Potassium 40	13966-00-2	18.5	1.0	0.36			GAM
Cobalt 60	10198-40-0	U		0.032	0.050	U	GAM
Cesium 137	10045-97-3	0.040	0.031	0.038	0.10	J	GAM
Radium 226	13982-63-3	U		0.11	0.10	U	GAM
Radium 228	15262-20-1	0.807	0.14	0.13	0.20		GAM
Europium 152	14683-23-9	U		0.080	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.071	0.10	U	GAM
Thorium 228	14274-82-9	0.743	0.046	0.043			GAM
Thorium 232	TH-232	0.807	0.14	0.13			GAM
Uranium 235	15117-96-1	U		0.12		U	GAM
Uranium 238	U-238	U		4.3		U	GAM
Americium 241	14596-10-2	U		0.041		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-08

B12XC2

DATA SHEET

SDG	7083	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109114-08	Client sample id	B12XC2		
Dept sample id	7083-008	Location/Matrix	100-F-19	SOLID	
Received	09/20/01	Collected/Weight	09/18/01 08:40	1453 g	
% solids	99.5	Custody/SAF No	B00-030-25	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	4.30	2.2	3.5	50	~~J~~	C
Nickel 63	13981-37-8	1.11	1.1	1.9	30	U	NI_L
Total Strontium	SR-RAD	-0.040	0.15	0.31	1.0	U	SR
Potassium 40	13966-00-2	14.9	0.56	0.23			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	U		0.022	0.10	U	GAM
Radium 226	13982-63-3	0.420	0.050	0.044	0.10		GAM
Radium 228	15262-20-1	0.618	0.11	0.11	0.20		GAM
Europium 152	14683-23-9	U		0.056	0.10	U	GAM
Europium 154	15585-10-1	U		0.086	0.10	U	GAM
Europium 155	14391-16-3	U		0.062	0.10	U	GAM
Thorium 228	14274-82-9	0.556	0.032	0.030			GAM
Thorium 232	TH-232	0.618	0.11	0.11			GAM
Uranium 235	15117-96-1	U		0.089		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Americium 241	14596-10-2	U		0.060		U	GAM

100 F Area - Full Protocol

12/4/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-09

B12XC3

DATA SHEET

SDG	7083	Client/Case no	Hanford
Contact	Melissa C. Mannion	Contract	No. 630
			SDG H1507
Lab sample id	R109114-09	Client sample id	B12XC3
Dept sample id	7083-009	Location/Matrix	100-F-19 SOLID
Received	09/20/01	Collected/Weight	09/18/01 08:33 1493 g
% solids	99.5	Custody/SAF No	B00-030-25 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	0.831	2.4	4.0	50	U J	C
Nickel 63	13981-37-8	0.208	1.2	2.1	30	U	NI_L
Total Strontium	SR-RAD	-0.054	0.12	0.26	1.0	U	SR
Potassium 40	13966-00-2	14.2	1.0	0.46			GAM
Cobalt 60	10198-40-0	U		0.060	0.050	U	GAM
Cesium 137	10045-97-3	U		0.048	0.10	U	GAM
Radium 226	13982-63-3	0.483	0.084	0.075	0.10		GAM
Radium 228	15262-20-1	0.812	0.21	0.19	0.20		GAM
Europium 152	14683-23-9	U		0.099	0.10	U	GAM
Europium 154	15585-10-1	U		0.18	0.10	U	GAM
Europium 155	14391-16-3	U		0.080	0.10	U	GAM
Thorium 228	14274-82-9	0.566	0.052	0.053			GAM
Thorium 232	TH-232	0.812	0.21	0.19			GAM
Uranium 235	15117-96-1	U		0.14		U	GAM
Uranium 238	U-238	U		6.3		U	GAM
Americium 241	14596-10-2	U		0.052		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-10

B12XC4

DATA SHEET

SDG	7083	Client/Case no	Hanford		SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109114-10	Client sample id	B12XC4		
Dept sample id	7083-010	Location/Matrix	100-F-19		SOLID
Received	09/20/01	Collected/Weight	09/18/01 08:30	1414 g	
% solids	99.4	Custody/SAF No	B00-030-25	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-0.176	2.1	3.5	50	U J	C
Nickel 63	13981-37-8	1.72	1.2	1.9	30	U	NI_L
Total Strontium	SR-RAD	0.009	0.12	0.25	1.0	U	SR
Potassium 40	13966-00-2	11.2	1.0	0.76			GAM
Cobalt 60	10198-40-0	U		0.055	0.050	U	GAM
Cesium 137	10045-97-3	U		0.077	0.10	U	GAM
Radium 226	13982-63-3	0.500	0.094	0.090	0.10		GAM
Radium 228	15262-20-1	0.632	0.22	0.23	0.20		GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.18	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Thorium 228	14274-82-9	0.549	0.055	0.058			GAM
Thorium 232	TH-232	0.632	0.22	0.23			GAM
Uranium 235	15117-96-1	U		0.18		U	GAM
Uranium 238	U-238	U		5.8		U	GAM
Americium 241	14596-10-2	U		0.12		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-11

B12XC5

DATA SHEET

SDG	7083	Client/Case no	Hanford		SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109114-11	Client sample id	B12XC5		
Dept sample id	7083-011	Location/Matrix	100-F-19		SOLID
Received	09/20/01	Collected/Weight	09/18/01 08:20	1251 g	
% solids	98.8	Custody/SAF No	B00-030-25	B00-030	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	3.49	2.5	4.0	50	U J	C
Nickel 63	13981-37-8	0.557	1.1	1.9	30	U	NI_L
Total Strontium	SR-RAD	0.032	0.086	0.14	1.0	U	SR
Potassium 40	13966-00-2	13.4	1.1	0.53			GAM
Cobalt 60	10198-40-0	U		0.061	0.050	U	GAM
Cesium 137	10045-97-3	U		0.058	0.10	U	GAM
Radium 226	13982-63-3	0.553	0.099	0.095	0.10		GAM
Radium 228	15262-20-1	0.792	0.27	0.24	0.20		GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.20	0.10	U	GAM
Europium 155	14391-16-3	U		0.090	0.10	U	GAM
Thorium 228	14274-82-9	0.835	0.079	0.074			GAM
Thorium 232	TH-232	0.792	0.27	0.24			GAM
Uranium 235	15117-96-1	U		0.15		U	GAM
Uranium 238	U-238	U		6.4		U	GAM
Americium 241	14596-10-2	U		0.057		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-12

B12XC6

DATA SHEET

SDG	7083	Client/Case no	Hanford SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109114-12	Client sample id	B12XC6
Dept sample id	7083-012	Location/Matrix	100-F-19 SOLID
Received	09/20/01	Collected/Weight	09/18/01 08:05 1352 g
% solids	99.4	Custody/SAF No	B00-030-25 B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	-0.940	1.9	3.3	50	U J	C
Nickel 63	13981-37-8	0.636	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	0.108	0.10	0.16	1.0	U	SR
Potassium 40	13966-00-2	13.4	1.1	0.69			GAM
Cobalt 60	10198-40-0	U		0.055	0.050	U	GAM
Cesium 137	10045-97-3	0.041	0.035	0.042	0.10	U	GAM
Radium 226	13982-63-3	0.420	0.092	0.091	0.10		GAM
Radium 228	15262-20-1	0.745	0.26	0.25	0.20		GAM
Europium 154	15585-10-1	U		0.17	0.10	U	GAM
Europium 155	14391-16-3	U		0.11	0.10	U	GAM
Thorium 228	14274-82-9	0.714	0.086	0.084			GAM
Thorium 232	TH-232	0.745	0.26	0.25			GAM
Uranium 235	15117-96-1	U		0.19		U	GAM
Uranium 238	U-238	U		6.3		U	GAM
Americium 241	14596-10-2	U		0.13		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-13

B12XC7

DATA SHEET

SDG	7083	Client/Case no	Hanford — SDG H1507
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109114-13	Client sample id	B12XC7
Dept sample id	7083-013	Location/Matrix	100-F-19 — SOLID
Received	09/20/01	Collected/Weight	09/18/01 08:20 — 1328 g
% solids	98.7	Custody/SAF No	B00-030-25 — B00-030

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Carbon 14	14762-75-5	4.92	3.2	5.2	50	U J	C
Nickel 63	13981-37-8	-0.138	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	0.081	0.14	0.26	1.0	U	SR
Potassium 40	13966-00-2	13.5	0.65	0.27			GAM
Cobalt 60	10198-40-0	U		0.028	0.050	U	GAM
Cesium 137	10045-97-3	U		0.050	0.10	U	GAM
Radium 226	13982-63-3	0.450	0.051	0.046	0.10		GAM
Radium 228	15262-20-1	0.708	0.13	0.12	0.20		GAM
Europium 152	14683-23-9	U		0.076	0.10	U	GAM
Europium 154	15585-10-1	U		0.11	0.10	U	GAM
Europium 155	14391-16-3	U		0.075	0.10	U	GAM
Thorium 228	14274-82-9	0.652	0.037	0.035			GAM
Thorium 232	TH-232	0.708	0.13	0.12			GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		3.7		U	GAM
Americium 241	14596-10-2	U		0.074		U	GAM

100 F Area - Full Protocol

12/9/01

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1507 was composed of seventeen solid (soil) samples designated under SAF No. B00-030 with a Project Designation of: 100 F Area – Full Protocol.

The samples were 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-Fax on November 3 and 5, 2001.

2.0 ANALYSIS NOTES

2.1 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.2 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.3 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.4 Gamma Spectroscopy 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 Mannion
Melissa C. Mannion
Program Manager

11/9/01
Date

Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1507 was composed of thirteen solid (soil) samples designated under SAF No. B00-030 with a Project Designation of: 100 F Area - Full Protocol.

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-Fax on October 29, 2001.

2.0 ANALYSIS NOTES

2.1 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

2.2 Total Strontium 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 Carbon-14 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 Mannion
Melissa C. Mannion
Program Manager

11/9/01
Date

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.	**Company Contact** Mike Stankovich	**Telephone No.** 531-7620	**Project Coordinator** TRENT, SJ
Price Code 8L	**Data Turnaround** 21 Days	**Air Quality** ☐	
Collector Stankovich/Nielson/Watson	**Sampling Location** 100-F-19 H1507 (7083)		**SAF No.** B00-030
Project Designation 100 F Area - Full Protocol	**Field Logbook No.** EL-1535-2	**COA** R10F192600	**Method of Shipment** FED EX
Ice Chest No. SEE OSPC	**Offsite Property No.** A010389		**Bill of Lading/Air Bill No.** SEE OSPC
Shipped To ~~KMA/RECRA~~			

POSSIBLE SAMPLE HAZARDS/REMARKS

TIETO B12685

Special Handling and/or Storage

SAMPLE ANALYSIS

Preservation	None	Cool 4C	None
Type of Container	sG	sG	sG
No. of Container(s)	1	1	1
Volume	60mL	125mL	1000mL
	Strontium-89,90 -- Total Sr; Nickel-63; Carbon-14; ~~Technetium-99~~ DJW 9-18-01	Chromium Hex - 7196 3/5 4/60	See item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time											
B12XC4	SOIL	9-18-01	0830	✓		✓							TIETO	12685
B12XC5	SOIL	9-18-01	0820	✓		✓								
B12XC6	SOIL	9-18-01	0805	✓		✓								
B12XC7	SOIL	9-18-01	0820	✓		✓								

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By	Date/Time	Received By	Date/Time
DJ WATSON/[signature]	9.18.01 1430	Ref. 2C STORED IN	9.18.01 1430
Ronald Thoren	0900 9-19-01	R Thoren	0900 9-19-01
Ref 2C 3728 9-19-01			
R Thoren	0900 9-19-01	FED EX	9-19-01
Fed Ex	9-20-01 1000	[signature] J Lind	9-20-01 1000

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 9/18/01. Collector not available to relinquish samples on 9/19/01 for shipment.

RT 9-19-01

Matrix *

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

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

BHI-EE-011 (10/99)

B00-030-25

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.

Company Contact: Mike Stankovich
Telephone No.: 531-7620
Project Coordinator: TRENT, SJ
Price Code: 8L
Data Turnaround: 21 Days
Air Quality ☐

Collector: Stankovich/Nielson/Watson
Sampling Location: 100-F-19 H1507 (7083)
SAF No.: B00-030
Project Designation: 100 F Area - Full Protocol
Field Logbook No.: EL-1535-2
COA: R10F192600
Method of Shipment: FED EX
Ice Chest No.: SEE OSPC
Offsite Property No.: A010389
Bill of Lading/Air Bill No.: See OSPC
Shipped To: ~~CMA/RECRA~~ DJW 9-18-01

POSSIBLE SAMPLE HAZARDS/REMARKS

TIE TO B12685

Special Handling and/or Storage

8700000

SAMPLE ANALYSIS

Preservation	None	Cool 4C	None
Type of Container	sG	sG	sG
No. of Container(s)	1	1	1
Volume	60mL	125mL	1000mL
	Strontium-89,90 – Total Sr; Nickel-63; Carbon-14; ~~Technetium-99~~ DJW 9-18-01	Chromium Hex 7196	See item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
B12XB9	SOIL	9-18-01	0900	✓		✓						TIE TO B12685	✓
B12XC0	SOIL	9-18-01	0855	✓		✓							
B12XC1	SOIL	9-18-01	0850	✓		✓							
B12XC2	SOIL	9-18-01	0840	✓		✓							
B12XC3	SOIL	9-18-01	0833	✓		✓							

CHAIN OF POSSESSION

Relinquished By (Sign/Print Names)	Date/Time	Received By (Sign/Print Names)	Date/Time
DJ WATERN / [signature]	9.18.01 1430	REF 2C / STORED IN	9.18.01 1430
Ref 2C 3728 / Dennis Ofner	9-19.01 0900	[signature] / RThoren	9-19-01 0900
RThoren / [signature]	9-19-01 0900	FED EX / [signature]	9-19-01
Fed Ex	9-20-01 1000	[signature] / J Lind	9-20-01 1000

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 9/18/01. Collector not available to relinquish samples on 9/19/01 for shipment.
RT 9-19-01

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

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

BHI-EE-011 (10/99)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.

Collector: Stankovich/Nielson/Watson	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Project Designation: 100 F Area - Full Protocol	Sampling Location: 100-F-19 H1507 (7083)		SAF No.: B00-030
Ice Chest No.: See OSPC	Field Logbook No.: EL-1535-2	COA: R10F192600	Method of Shipment: FED EX
Shipped To: ~~CMA/RECRA~~ DSW 9-18-01	Offsite Property No.: A010 389		Bill of Lading/Air Bill No.: See OSPC

Price Code: 8L

Air Quality ☐

Data Turnaround: 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Tie to B12685

Special Handling and/or Storage

6400

Preservation	None	Cool 4C	None							
Type of Container	aG	aG	aG							
No. of Container(s)	1	1	1							
Volume	60mL	125mL	1000mL							
SAMPLE ANALYSIS	Strontium-89,90 – Total Sr; Nickel-63; Carbon-14; ~~Technetium-99~~ DSW 9-18-01	Chromium (VI) - 7196	See item (1) in Special Instructions.							

Sample No.	Matrix *	Sample Date	Sample Time										
~~B12XB4~~	SOIL			✓		✓		9-18-01				TIE TO	12685
B12XB5	SOIL	9-18-01	0940	✓		✓							
B12XB6	SOIL	9-18-01	0935	✓		✓							
B12XB7	SOIL	9-18-01	0930	✓		✓							
B12XB8	SOIL	9-18-01	0925	✓		✓							

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
DS WATSON	9-18-01 1430	STORED IN REF. 2C	9-18-01 1430
Relinquished By: Relinquished Over R.O. 2C 3728	Date/Time 0900 9-19-01	Received By: R Thoren	Date/Time 0900 9-19-01
Relinquished By: R Thoren	Date/Time 0900 9-19-01	Received By: FED EX	Date/Time 9-19-01
Relinquished By: Fed Ex	Date/Time 9-20-01 1000	Received By: J L Lind	Date/Time 9-20-01 1000
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 9/18/01. Collector not available to relinquish samples on 9/19/01 for shipment.
DT 9-19-01

Matrix *

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

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

Title

BHI-EE-011 (10/99)

B00-030-022

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.

Collector	Stankovich/Nielson
Project Designation	100 F Area - Full Protocol
Ice Chest No.	ERC-01-031
Shipped To	~~TMA/RECRA~~
Company Contact	Mike Stankovich
Telephone No.	531-7620
Sampling Location	116-F-14 H1507 (7084)
Field Logbook No.	EL-1535-2
COA	R16F142600
Offsite Property No.	RSR # 107027
Project Coordinator	TRENT, SJ
SAF No.	B00-030
Price Code	8L
Air Quality	☐
Data Turnaround	21 Days
Method of Shipment	Federal Express
Bill of Lading/Air Bill No.	N/A

POSSIBLE SAMPLE HAZARDS/REMARKS
LTD QTY Radioactive
Tie TO: B10RL2, B10RL6

Special Handling and/or Storage

050000

Preservation	None	Cool 4C	None	None
Type of Container	sG	sG	sG	P
No. of Container(s)	1	1	1	1
Volume	60mL	125mL	250mL	1000mL
SAMPLE ANALYSIS	Strontium-89,90 -- Total Sr, Nickel-63; Carbon-14; ~~Technetium-99~~ RJN 9-14-01	Chromium Hex - 7196 DJW 09-17-01	See item (1) in Special Instructions. Chromium Cobalt only	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time				
B12WW5	SOIL	09/17/01	~~0820~~ 0735	X			X
B12WW6	SOIL	09/17/01	0920	X			X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	9-17-01 1600	Stored in 1B	9-17-01 1600
Removed from 1B 3728	9-19-01 0700	R Thoren	9-19-01 0700
R Thoren	9-19-01 0700	FedEx	9-19-01
FedEx	9-20-01 1000	J Lind	9-20-01 1000

SPECIAL INSTRUCTIONS
09/17/01 DJW Cobalt RJN 9-14-01
~~(1) ICP Metals - 6010A (Superfund) (Arsenic, Chromium, Lead); Mercury - 7471 - (CV)~~
(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

Samples stored in Ref.# 1B at the 3728 Shipping Facility on 9/17/01.
Collector not available to relinquish samples on 9/19/01 for shipment.
RT 9-19-01

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

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

BHI-EE-011 (10/99)

B00-030-022

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Collector: Stankovich/Nielson	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Project Designation: 100 F Area - Full Protocol	Sampling Location: 116-F-14 H1507 (7084)		SAF No.: B00-030
Ice Chest No.: ERC-01-031	Field Logbook No.: EL-1535-2	COA: R16F142600	Method of Shipment: Federal Express
Shipped To: (MA) ~~REGRA~~ DSW 09/17/01	Offsite Property No.: RSR# 107027		Bill of Lading/Air Bill No.: NA

Price Code: 8L

Data Turnaround: 21 Days

Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

LTD. QTY Radioactive

Special Handling and/or Storage: Tie all TO B10RL2, B10RL6

Preservation	None	Cool 4C	None	None									
Type of Container	aG	aG	aG	P									
No. of Container(s)	1	1	1	1									
Volume	60mL	125mL	250mL	1000mL									
SAMPLE ANALYSIS	Strontium-89,90 -- Total Sr; Nickel-63; Carbon-14; ~~Technetium-99~~ RJN 9-14-01	Chromium Hex - 7196 DSW 09-17-01	See item (1) in Special Instructions. Chromium Cobalt only	See item (2) in Special Instructions.									
Sample No.	Matrix *	Sample Date	Sample Time										
B12WW0	SOIL	09/17/01	0945	X			X						D1
B12WW1	SOIL	09/17/01	0830	X			X						D2
B12WW2	SOIL	09/17/01	0915	X			X						E3
B12WW3	SOIL	09/17/01	0905	X			X						E4
B12WW4	SOIL	09/17/01	0845	X			X						E5

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

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	9/17/01 1600	Stored in 1B	9-17-01 1600
Removed from Ref 1B 3728	9-19-01 0700	RThoren	9-19-01 0700
RThoren	9-19-01 0700	FEDEX	9-19-01
Fed Ex	9-20-01 1000	JLind	9-20-01 1000

SPECIAL INSTRUCTIONS

DSW 09/17/01 cobalt 9/14/01 RJN

(1) ~~ICP Metals - 6010A (Supertrace) (Arsenic, Chromium, Lead); Mercury - 7471 - (CV)~~

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

Samples stored in Ref.# 1B at the 3728 Shipping Facility on 9/17/01 Collector not available to relinquish samples on 9/17/01 for shipment.

RT 9-19-01

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

BHI-EE-011 (10/99)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B00-030-022

Bechtel Hanford Inc.

Collector: Stankovich/Nielson

Company Contact: Mike Stankovich — Telephone No.: 531-7620

Project Coordinator: TRENT, SJ

Price Code: 8L — Data Turnaround: 21 Days

Air Quality ☐

Project Designation: 100 F Area - Full Protocol

Sampling Location: 116-F-14 H1507 (7084)

SAF No.: B00-030

Ice Chest No.: CRC-01-042

Field Logbook No.: EL-1535-2 — COA: R16F142600

Method of Shipment: Federal Express

Shipped To: ~~CMA~~ ~~RECRA~~ DSW 09/17/01

Offsite Property No.: RSR # 107027

Bill of Lading/Air Bill No.: N/A

POSSIBLE SAMPLE HAZARDS/REMARKS: LTD. QTY Radioactive

Special Handling and/or Storage: TIE ALL TO ~~B12W~~ RT 9-18-01 B10RL2, B10RL6

Preservation	None	Cool 4C	None	None
Type of Container	sG	sG	sG	P
No. of Container(s)	1	1	1	1
Volume	60mL	125mL	250mL	1000mL
SAMPLE ANALYSIS	Strontium-89,90 -- Total Sr; Nickel-63; Carbon-14; ~~Technetium-99~~ RJN 9/14/01	Chromium Hex - 7199 DSW 9/17/01	See item (1) in Special Instructions. Chromium Cobalt only RT 9-18-01	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time										
B12WV5	SOIL	09/17/01	0820	X		X	X						B6
B12WV6	SOIL	09/17/01	0940	X		X	X						C7
B12WV7	SOIL	09/17/01	0950	X		X	X						C8
B12WV8	SOIL	09/17/01	0840	X		X	X						C9
B12WV9	SOIL	09/17/01	0910	X		X	X						D10

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	9-17-01 1600	Stored in 1B	9-17-01 1600
Removed from 1B 3728	9-19-01 0700	R Thoren	9-19-01 0700
R Thoren	9-17-01 0700	FED EX	9-19-01
FedEx	9-20-01 1000	Linda	9-20-01 1000

SPECIAL INSTRUCTIONS

(1) ~~ICP Metals - 6010A (Supertrace) (Arsenic, Chromium, Lead), Mercury - 7471 (CV)~~ Cobalt DSW 09/17/01 RJN 9/14/01

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

Samples stored in Ref.# 1B at the 3728
Shipping Facility on 9/17/01.
Collector not available to relinquish samples on 9/19/01 for shipment.
RT 9-19-01

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

LABORATORY SECTION: Received By — Date/Time — Disposed By — Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method

BHI-EE-011 (10/99)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B00-030-022 | Page 1 of 2

Bechtel Hanford Inc.

Collector: Stankovich/Nielson

Project Designation: 100 F Area - Full Protocol

Ice Chest No.: ERC 99-013

Shipped To: ~~TMA/RECRA~~ DJW 09/17/01

Company Contact: Mike Stankovich | Telephone No.: 531-7620

Sampling Location: 116-F-14 H1507 (7084)

Field Logbook No.: EL-1535-2 | COA: R16F142600

Offsite Property No.: RSP # 107027

Project Coordinator: TRENT, SJ

SAF No.: B00-030

Price Code: 8L | Data Turnaround: 21 Days

Air Quality ☐

Method of Shipment: Federal Express

Bill of Lading/Air Bill No.: WA

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage

C00053

SAMPLE ANALYSIS

Preservation	None	Cool 4C	None	None
Type of Container	aG	aG	aG	P
No. of Container(s)	1	1	1	1
Volume	60mL	125mL	250mL	1000mL
	Strontium-89,90 – Total Sr, Nickel-63; Carbon-14; ~~Technetium-99~~ RJN 9/14/01	Chromium Hex - 7196 DJW 09/17/01	See item (1) in Special Instructions. Chromium Cobalt only	See item (2) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time					
B12WV0	SOIL	09/17/01	0925	X			X	A1
B12WV1	SOIL	09/17/01	0930	X			X	A2
B12WV2	SOIL	09/17/01	0810	X			X	A3
B12WV3	SOIL	09/17/01	0935	X			X	B4
B12WV4	SOIL	09/17/01	0947	X			X	B5

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	9-17-01 1600	Shed in IB	9-17-01 1600
Rend Thoren	9-19-01 0700	R Thoren	9-19-01 0700
Ref IB 3728	9-19-01		
R Thoren	9-19-01 0700	FED EX	9-19-01
FedEx	9-20-01 1000	J Lind	9-20-01 1000

SPECIAL INSTRUCTIONS

DJW 09/17/01 Cobalt 9/14/01

(1) ~~ICP Metals - 6010A (Superfund) (Arsenic, Chromium, Lead); Mercury - 7471 - (CV)~~ RJN

(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)

Samples stored in Ref.# IB at the 3728 Shipping Facility on 9/17/01.
Collector not available to relinquish samples on 9/19/01 for shipment.
RT 9-19-01

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

Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

Title | Date/Time

LABORATORY SECTION: Received By | Disposed By | Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method

BHI-EE-011 (10/99)

Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100F - 100-F-19 + 14			DATA PACKAGE: H1507		
VALIDATOR: TCI		LAB: EB		DATE: 2Dec01	
CASE:			SDG: H1507		

ANALYSES PERFORMED

☐ Gross Alpha/Beta	☒ Strontium-90	☐ Technetium-99	☐ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	☒ Ni-63	X-C14	

SAMPLES/MATRIX B12WV0 B12WV1 B12WV2 B12WV3 B12WV4 B12WV5 B12WV6 B12WV7 B12WV8 B12WV9 B12WW0 B12WW1 B12WW2 B12WW3 B12WW4 B12WW5 B12WW6 B12XB5 B12XB6 B12XB7 B12XB7 B12XB8 B12XB9 B12XC0 B12XC1 B12XC2 B12XC3 B12XC4 B12XC5 B12XC6 B12XC7

Soil

1. Completeness . . . . . ☒ N/A

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

Comments:

2. Initial Calibration . . . . . ☒ N/A

Instruments/detectors calibrated within one year of sample analysis? . . . . . Yes No N/A

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

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

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

Comments:

A-12

3. Continuing Calibration . . . . . ☒ N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A
Calibration check acceptable? . . . . . Yes No N/A
Calibration check standards NIST traceable? . . . . . Yes No N/A
Calibration check standards expired? . . . . . Yes No N/A

Comments:

4. Blanks . . . . . ☐ N/A

Method blank analyzed? . . . . . 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? . . . . . Yes No N/A

Comments: FB WWS – K40 Ra 226/228 Th 228/232

5. Matrix Spikes . . . . . ☐ N/A

Matrix spike analyzed? . . . . . Yes No N/A
Spike recoveries acceptable? . . . . . Yes No N/A
Spike source traceable? . . . . . Yes No N/A
Spike source expired? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments: C-14 – I

A-2

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . Yes No N/A
LCS recoveries acceptable? . . . . . Yes No N/A
LCS traceable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

7. Chemical Recovery . . . . . ☐ N/A

Chemical carrier added? . . . . . Yes No N/A
Chemical recovery acceptable? . . . . . Yes No N/A
Chemical carrier traceable? . . . . . Yes No N/A
Chemical carrier expired? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A

Comments:_____

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . Yes No N/A
RPD Values Acceptable? . . . . . Yes ~~Yes~~ ~~No~~ N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:_____

9. Field QC Samples . . . . . ☐ 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:

10. Holding Times

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

Comments:

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . . Yes No N/A
Results supported in raw data? . . . . . Yes No N/A
Results Acceptable? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A
MDA's meet required detection limits? . . . . . Yes No N/A
Transcription/calculation errors? . . . . . Yes No N/A

Comments: 127/440 over

A-4

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-19

Method Blank

METHOD BLANK

SDG 7084
Contact Melissa C. Mannion

Client/Case no Hanford
Contract No. 630

SDG H1507

Lab sample id R109115-19
Dept sample id 7084-019

Client sample id Method Blank
Material/Matrix
SAF No B00-030

SOLID

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-3.58	2.8	4.8	50	U	C
Nickel 63	13981-37-8	-0.169	1.2	2.0	30	U	NI_L
Total Strontium	SR-RAD	-0.042	0.11	0.23	1.0	U	SR
Potassium 40	13966-00-2	U		0.49		U	GAM
Cobalt 60	10198-40-0	U		0.018	0.050	U	GAM
Cesium 137	10045-97-3	U		0.018	0.10	U	GAM
Radium 226	13982-63-3	U		0.037	0.10	U	GAM
Radium 228	15262-20-1	U		0.087	0.20	U	GAM
Europium 152	14683-23-9	U		0.045	0.10	U	GAM
Europium 154	15585-10-1	U		0.050	0.10	U	GAM
Europium 155	14391-16-3	U		0.032	0.10	U	GAM
Thorium 228	14274-82-9	U		0.024		U	GAM
Thorium 232	TH-232	U		0.087		U	GAM
Uranium 235	15117-96-1	U		0.061		U	GAM
Uranium 238	U-238	U		1.9		U	GAM
Americium 241	14596-10-2	U		0.019		U	GAM

100 F Area - Full Protocol

QC-BLANK 39874

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109115-18

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7084
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1507
Case no No. 630

Lab sample id R109115-18
Dept sample id 7084-018

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B00-030

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
Carbon 14	10500	110	15	50		C	11300	450	93	85-115	80-120
Nickel 63	233	4.3	2.0	30		NI_L	232	9.3	100	84-116	80-120
Total Strontium	23.7	0.90	0.25	1.0		SR	21.9	0.88	108	82-118	80-120
Cobalt 60	1.21	0.076	0.030	0.050		GAM	1.14	0.046	106	73-127	80-120
Cesium 137	1.44	0.070	0.043	0.10		GAM	1.30	0.052	111	73-127	80-120

100 F Area - Full Protocol

QC-LCS 39873

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

B12WV2

R109115-20

DUPLICATE

SDG 7084
Contact Melissa C. Mannion

DUPLICATE
Lab sample id R109115-20
Dept sample id 7084-020

% solids 99.8

ORIGINAL
Lab sample id R109115-03
Dept sample id 7084-003
Received 09/20/01
% solids 99.8

Client/Case no Hanford SDG H1507
Case no No. 630

Client sample id B12WV2
Location/Matrix 116-F-14 SOLID
Collected/Weight 09/17/01 08:10 1281 g
Custody/SAF No B00-030-22 B00-030

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 PROT TOT LIMIT
Carbon 14	1.88	2.5	4.1	50	U	C	1.22	2.7	4.5	U	-	
Nickel 63	10.7	1.6	2.2	30	J	NI_L	11.0	1.6	2.1	J	3	38
Total Strontium	0.146	0.085	0.13	1.0	J	SR	0.124	0.11	0.21	U	16	156
Potassium 40	12.9	1.2	0.83			GAM	14.8	1.2	0.70		14	37
Cobalt 60	0.231	0.083	0.082	0.050		GAM	0.238	0.066	0.062		3	75
Cesium 137	4.11	0.16	0.12	0.10		GAM	4.09	0.16	0.12		0	33
Radium 226	0.454	0.14	0.17	0.10		GAM	0.490	0.17	0.18		8	77
Radium 228	0.712	0.32	0.37	0.20		GAM	0.890	0.39	0.40		22	100
Europium 152	3.94	0.26	0.26	0.10		GAM	3.86	0.28	0.29		2	35
Europium 154	0.422	0.24	0.26	0.10		GAM	0.396	0.27	0.28		6	136
Europium 155	U		0.22	0.10	U	GAM	U		0.22	U	-	
Thorium 228	0.739	0.10	0.12			GAM	0.667	0.068	0.092		10	41
Thorium 232	0.712	0.32	0.37			GAM	0.890	0.39	0.40		22	100
Uranium 235	U		0.32		U	GAM	U		0.31	U	-	
Uranium 238	U		11		U	GAM	U		10	U	-	
Americium 241	U		0.29		U	GAM	U		0.28	U	-	

100 F Area - Full Protocol

QC-DUP#3 39875

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 11/07/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-15 Method Blank

METHOD BLANK

SDG	7083	Client/Case no	Hanford	SDG H1507	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109114-15	Client sample id	Method Blank		
Dept sample id	7083-015	Material/Matrix		SOLID	
		SAF No	B00-030		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Carbon 14	14762-75-5	-1.87	2.4	4.1	50	U	C
Nickel 63	13981-37-8	0.350	1.1	1.8	30	U	NI_L
Total Strontium	SR-RAD	-0.138	0.13	0.29	1.0	U	SR
Potassium 40	13966-00-2	U		0.36		U	GAM
Cobalt 60	10198-40-0	U		0.015	0.050	U	GAM
Cesium 137	10045-97-3	U		0.016	0.10	U	GAM
Radium 226	13982-63-3	U		0.042	0.10	U	GAM
Radium 228	15262-20-1	U		0.068	0.20	U	GAM
Europium 152	14683-23-9	U		0.040	0.10	U	GAM
Europium 154	15585-10-1	U		0.052	0.10	U	GAM
Europium 155	14391-16-3	U		0.037	0.10	U	GAM
Thorium 228	14274-82-9	U		0.023		U	GAM
Thorium 232	TH-232	U		0.068		U	GAM
Uranium 235	15117-96-1	U		0.057		U	GAM
Uranium 238	U-238	U		2.2		U	GAM
Americium 241	14596-10-2	U		0.068		U	GAM

100 F Area - Full Protocol

QC-BLANK 39840

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-14

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7083
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1507
Case no No. 630

Lab sample id R109114-14
Dept sample id 7083-014

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B00-030

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
Carbon 14	11000	220	28	50		C	11300	450	97	84-116	80-120
Nickel 63	258	4.7	1.8	30		NI_L	264	11	98	84-116	80-120
Total Strontium	21.6	0.76	0.20	1.0		SR	23.0	0.92	94	84-116	80-120
Cobalt 60	1.16	0.074	0.032	0.050		GAM	1.22	0.049	95	76-124	80-120
Cesium 137	1.36	0.067	0.037	0.10		GAM	1.39	0.056	98	76-124	80-120

100 F Area - Full Protocol

QC-LCS 39839

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 10/29/01

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1507

R109114-16

B12XC0

DUPLICATE

SDG	7083			Client/Case no	Hanford SDG H1507
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R109114-16	Lab sample id	R109114-06	Client sample id	B12XC0
Dept sample id	7083-016	Dept sample id	7083-006	Location/Matrix	100-F-19 SOLID
		Received	09/20/01	Collected/Weight	09/18/01 08:55 1452 g
% solids	99.1	% solids	99.1	Custody/SAF No	B00-030-25 B00-030

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
Carbon 14	1.25	2.0	3.3	50	U	C	3.94	2.8	4.5	U	-		
Nickel 63	0.442	1.2	2.0	30	U	NI_L	0.277	1.1	1.9	U	-		
Total Strontium	-0.019	0.11	0.24	1.0	U	SR	0.032	0.15	0.30	U	-		
Potassium 40	16.5	0.98	0.34			GAM	17.4	0.89	0.32		5	34	
Cobalt 60	U		0.031	0.050	U	GAM	U		0.029	U	-		
Cesium 137	U		0.031	0.10	U	GAM	U		0.027	U	-		
Radium 226	U		0.11	0.10	U	GAM	U		0.094	U	-		
Radium 228	0.890	0.16	0.15	0.20		GAM	0.749	0.14	0.13		17	50	
Europium 152	U		0.073	0.10	U	GAM	U		0.063	U	-		
Europium 154	U		0.11	0.10	U	GAM	U		0.10	U	-		
Europium 155	U		0.098	0.10	U	GAM	U		0.059	U	-		
Thorium 228	0.724	0.044	0.040			GAM	0.715	0.039	0.035		1	34	
Thorium 232	0.890	0.16	0.15			GAM	0.749	0.14	0.13		17	50	
Uranium 235	U		0.11		U	GAM	U		0.098	U	-		
Uranium 238	U		4.1		U	GAM	U		3.3	U	-		
Americium 241	U		0.040		U	GAM	U		0.034	U	-		

100 F Area - Full Protocol

QC-DUP#6 39841

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	10/29/01

Date: 10 December 2000
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100F Areas - Full Protocol - Waste Sites 100-F-19 and 116-F-14
Subject: Inorganics - Data Package No. H1507-LLI (SDG No. H1507)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1507-LLI prepared by Lionville Laboratory Inc. (LLI). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B12WV0	9/17/01	Soil	C	See note 1 & 2
B12WV1	9/17/01	Soil	C	See note 1 & 2
B12WV2	9/17/01	Soil	C	See note 1 & 2
B12WV3	9/17/01	Soil	C	See note 1 & 2
B12WV4	9/17/01	Soil	C	See note 1 & 2
B12WV5	9/17/01	Soil	C	See note 1 & 2
B12WV6	9/17/01	Soil	C	See note 1 & 2
B12WV7	9/17/01	Soil	C	See note 1 & 2
B12WV8	9/17/01	Soil	C	See note 1 & 2
B12WV9	9/17/01	Soil	C	See note 1 & 2
B12WW0	9/17/01	Soil	C	See note 1 & 2
B12WW1	9/17/01	Soil	C	See note 1 & 2
B12WW2	9/17/01	Soil	C	See note 1 & 2
B12WW3	9/17/01	Soil	C	See note 1 & 2
B12WW4	9/17/01	Soil	C	See note 1 & 2
B12WW5	9/17/01	Soil	C	See note 1 & 2
B12WW6	9/17/01	Soil	C	See note 1 & 2
B12XB5	9/18/01	Soil	C	See note 1
B12XB6	9/18/01	Soil	C	See note 1
B12XB7	9/18/01	Soil	C	See note 1
B12XB8	9/18/01	Soil	C	See note 1

Sample ID	Sample Date	Media	Validation	Analysis
B12XB9	9/18/01	Soil	C	See note 1
B12XC0	9/18/01	Soil	C	See note 1
B12XC1	9/18/01	Soil	C	See note 1
B12XC2	9/18/01	Soil	C	See note 1
B12XC3	9/18/01	Soil	C	See note 1
B12XC4	9/18/01	Soil	C	See note 1
B12XC5	9/18/01	Soil	C	See note 1
B12XC6	9/18/01	Soil	C	See note 1
B12XC7	9/18/01	Soil	C	See note 1

1 - Chromium VI by 7196A.
2- ICP metals by 6010B (total chromium and cobalt).

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL September 2000). 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 PARAMETERS

- **Holding Times**

  Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 6 months for ICP metals and 30 days for chromium VI.

  All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

At least one preparation blank, consisting of deionized distilled water processed through each sample preparation and analysis procedure, must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with digestate concentrations less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the contract required detection limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the instrument detection limit (IDL) and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field (Equipment) Blank

One equipment blank (B12WW5)was submitted for analysis. Total chromium was detected in the equipment blank. Under the BHI statement of work, no qualification is required. All other equipment blank results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike (MS) analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery of 142.3%, all chromium VI results in samples B12WV0, B12WV1, B12WV2, B12WV3, B12WV4, B12WV5, B12WV6, B12WV7, B12WV8, B12WV9, B12WW0, B12WW1, B12WW2, B12WW3, B12WW4, B12WW5, B12WW6 were qualified as estimates and flagged "J".

All other matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Analytical precision is expressed by the relative percent differences (RPD) between the recoveries of matrix spike duplicate (MSD) analyses performed on a sample in the analytical batch. Precision may alternatively be assessed using unspiked duplicate analyses performed on a sample in the analytical batch. If both sample and replicate activities (concentrations) are greater than five times the CRDL and the RPD is less than 30%, no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicate samples were submitted for analysis (B12WV5/B12WW6). All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan TDLs to ensure that laboratory detection levels meet the required criteria. All reported results met the analyte specific TDL.

- **Completeness**

Data package No. H1507-LLI 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 a matrix spike recovery of 142.3%, all chromium VI results in samples B12WV0, B12WV1, B12WV2, B12WV3, B12WV4, B12WV5, B12WV6, B12WV7, B12WV8, B12WV9, B12WW0, B12WW1, B12WW2, B12WW3, B12WW4, B12WW5, B12WW6 were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI 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.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

DOE/RL-96-22, Rev. 2, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, September 2000.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

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.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

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.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H1507	REVIEWER: TLI	DATE: 12/10/01	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium VI	J	B12WV0, B12WV1 B12WV2, B12WV4, B12WV5, B12WV6, B12WV7, B12WV8, B12WV9, B12WW0, B12WW1, B12WW3 B12WW4, B12WW6	Matrix spike

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																					
Laboratory: LLI																					
Case	SDG: H1507																				
Sample Number		B12WV0		B12WV1		B12WV2		B12WV3		B12WV4		B12WV5		B12WV6		B12WV7		B12WV8		B12WV9	
Location																					
Remarks		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14	
Sample Date		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01	
Inorganics	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	5.5	J	11.2	J	5.3	J	0.40	U	6.1	J	4.3	J	5.2	J	5.5	J	5.1	J	0.40	UJ
Cobalt		4.2		5.0		5.1		6.4		4.6		5.0		6.0		5.0		5.2		6.5	
Chromium (total)	0.5	77.1		134		66.4		36.5		74.5		76.8		195		86.5		84.5		30.0	
Sample Number		B12WW0		B12WW1		B12WW2		B12WW3		B12WW4		B12WW5		B12WW6		B12XB5		B12XB6		B12XB7	
Remarks												E. Blank		Duplicate							
Location		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		116-F-14		100-F-19		100-F-19		100-F-19	
Sample Date		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/17/01		9/18/01		9/18/01		9/18/01	
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	6.7	J	6.0	J	0.40	U	7.5	J	3.4	J	0.40	U	4.9	J	0.40	U	0.40	U	0.40	U
Cobalt		5.4		5.9		7.2		6.3		4.8		0.09	U	5.2		N/A		N/A		N/A	
Chromium (total)	0.5	89.3		82.3		14.6		157		70.3		0.27		80.3		N/A		N/A		N/A	
Sample Number		B12XB8		B12XB9		B12XC0		B12XC1		B12XC2		B12XC3		B12XC4		B12XC5		B12XC6		B12XC7	
Remarks																					
Location		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19		100-F-19	
Sample Date		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01		9/18/01	
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.5	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U	0.40	U
Cobalt		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A	
Chromium (total)	0.5	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A	

N/A = Not Analyzed

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507 LVL LOT #: 0109L884

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12WV0	Cobalt, Total	4.2	MG/KG	0.09	1.0
		Chromium, Total	77.1	MG/KG	0.14	1.0
-002	B12WV1	Cobalt, Total	5.0	MG/KG	0.09	1.0
		Chromium, Total	134	MG/KG	0.14	1.0
-003	B12WV2	Cobalt, Total	5.1	MG/KG	0.09	1.0
		Chromium, Total	66.4	MG/KG	0.14	1.0
-004	B12WV3	Cobalt, Total	6.4	MG/KG	0.08	1.0
		Chromium, Total	36.5	MG/KG	0.12	1.0
-005	B12WV4	Cobalt, Total	4.6	MG/KG	0.09	1.0
		Chromium, Total	74.5	MG/KG	0.14	1.0
-006	B12WV5	Cobalt, Total	5.0	MG/KG	0.08	1.0
		Chromium, Total	76.8	MG/KG	0.13	1.0
-007	B12WV6	Cobalt, Total	6.0	MG/KG	0.08	1.0
		Chromium, Total	195	MG/KG	0.13	1.0
-008	B12WV7	Cobalt, Total	5.0	MG/KG	0.08	1.0
		Chromium, Total	86.5	MG/KG	0.13	1.0
-009	B12WV8	Cobalt, Total	5.2	MG/KG	0.09	1.0
		Chromium, Total	84.5	MG/KG	0.14	1.0
-010	B12WV9	Cobalt, Total	6.5	MG/KG	0.09	1.0
		Chromium, Total	30.0	MG/KG	0.14	1.0

R 12/8/01

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507 LVL LOT #: 0109L884

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	B12WW0	Cobalt, Total	5.4	MG/KG	0.09	1.0
		Chromium, Total	89.3	MG/KG	0.13	1.0
-012	B12WW1	Cobalt, Total	5.9	MG/KG	0.09	1.0
		Chromium, Total	82.3	MG/KG	0.14	1.0
-013	B12WW2	Cobalt, Total	7.2	MG/KG	0.09	1.0
		Chromium, Total	14.6	MG/KG	0.14	1.0
-014	B12WW3	Cobalt, Total	6.3	MG/KG	0.09	1.0
		Chromium, Total	157	MG/KG	0.14	1.0
-015	B12WW4	Cobalt, Total	4.8	MG/KG	0.09	1.0
		Chromium, Total	70.3	MG/KG	0.13	1.0
-016	B12WW5	Cobalt, Total	0.09 u	MG/KG	0.09	1.0
		Chromium, Total	0.27	MG/KG	0.14	1.0
-017	B12WW6	Cobalt, Total	5.2	MG/KG	0.09	1.0
		Chromium, Total	80.3	MG/KG	0.14	1.0

12/9/01

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507 LVL LOT #: 0109L884

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12WV0	% Solids	99.9	%	0.01	1.0
		Chromium VI	5.5 J	MG/KG	0.40	1.0
-002	B12WV1	% Solids	99.6	%	0.01	1.0
		Chromium VI	11.2 J	MG/KG	0.40	1.0
-003	B12WV2	% Solids	100	%	0.01	1.0
		Chromium VI	5.3 J	MG/KG	0.40	1.0
-004	B12WV3	% Solids	100	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-005	B12WV4	% Solids	99.9	%	0.01	1.0
		Chromium VI	6.1 J	MG/KG	0.40	1.0
-006	B12WV5	% Solids	99.9	%	0.01	1.0
		Chromium VI	4.3 J	MG/KG	0.40	1.0
-007	B12WV6	% Solids	99.9	%	0.01	1.0
		Chromium VI	5.2 J	MG/KG	0.40	1.0
-008	B12WV7	% Solids	99.8	%	0.01	1.0
		Chromium VI	5.5 J	MG/KG	0.40	1.0
-009	B12WV8	% Solids	99.7	%	0.01	1.0
		Chromium VI	5.1 J	MG/KG	0.40	1.0
-010	B12WV9	% Solids	99.9	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0

12/9/01

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507

WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0109L884

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	B12WW0	% Solids	99.9	%	0.01	1.0
		Chromium VI	6.7 J	MG/KG	0.40	1.0
-012	B12WW1	% Solids	99.8	%	0.01	1.0
		Chromium VI	6.0 J	MG/KG	0.40	1.0
-013	B12WW2	% Solids	99.8	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-014	B12WW3	% Solids	99.5	%	0.01	1.0
		Chromium VI	7.5 J	MG/KG	0.40	1.0
-015	B12WW4	% Solids	99.8	%	0.01	1.0
		Chromium VI	3.4 J	MG/KG	0.40	1.0
-016	B12WW5	% Solids	99.9	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-017	B12WW6	% Solids	99.5	%	0.01	1.0
		Chromium VI	4.9 J	MG/KG	0.40	1.0

12/9/01

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507

LVL LOT #: 0109L885

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12XB5	% Solids	99.7	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-002	B12XB6	% Solids	100	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-003	B12XB7	% Solids	99.8	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-004	B12XB8	% Solids	99.8	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-005	B12XB9	% Solids	99.9	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-006	B12XC0	% Solids	99.7	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-007	B12XC1	% Solids	99.9	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-008	B12XC2	% Solids	99.8	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-009	B12XC3	% Solids	99.8	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-010	B12XC4	% Solids	100	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0

12/9/01

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507

WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0109L885

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	B12XC5	% Solids	98.5	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-012	B12XC6	% Solids	99.8	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-013	B12XC7	% Solids	99.6	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0

12/4/01

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B00-030 H1507
LVL#: 0109L884 and 0109L885

W.O.#: 11343-606-001-9999-00
Date Received: 09-20-01

INORGANIC NARRATIVE

1. This narrative covers the analyses of 30 soil samples.

2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The cooler temperature was recorded on the chain of custody.

5. The method blank for Chromium VI was within the method criteria.

6. The Laboratory Control Sample (LCS) for Soluble Chromium VI was within the laboratory control limits, however LCS for Insoluble Chromium VI was above the 80-120% control limit.

7. The matrix spike (MS) recoveries for Soluble Chromium VI sample B12MV0 and Insoluble Chromium VI sample B12XC5 were within the 75-125% control limits, however MS recoveries for Insoluble Chromium VI sample B12MV0 was above the control limit that may be attributed to sample inhomogeneity and MS recovery for Soluble VI sample B12XC5 was below the control limit that may be attributed to matrix interference.

8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.

9. Results for solid samples are reported on a dry weight basis.

10. 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.

for Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

10-10-01
Date

njp\i09-885

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 31 pages.

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		__ 9071A	
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	

Other: **Method:**

Other: **Method**

OCT 2001
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-030 H1507

DATE RECEIVED: 09/20/01

LVL LOT # :0109L884

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12WV0						
% SOLIDS	001	S	01L%S132	09/17/01	10/03/01	10/04/01
% SOLIDS	001 REP	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	001	S	01LVI077	09/17/01	10/08/01	10/08/01
CHROMIUM VI	001 REP	S	01LVI077	09/17/01	10/08/01	10/08/01
CHROMIUM VI	001 MS	S	01LVI077	09/17/01	10/08/01	10/08/01
CHROMIUM VI	001 MSD	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WV1						
% SOLIDS	002	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	002	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WV2						
% SOLIDS	003	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	003	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WV3						
% SOLIDS	004	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	004	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WV4						
% SOLIDS	005	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	005	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WV5						
% SOLIDS	006	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	006	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WV6						
% SOLIDS	007	S	01L%S132	09/17/01	10/03/01	10/04/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-030 H1507

DATE RECEIVED: 09/20/01

LVL LOT # :0109L884

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	007	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WV7						
% SOLIDS	008	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	008	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WV8						
% SOLIDS	009	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	009	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WV9						
% SOLIDS	010	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	010	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WW0						
% SOLIDS	011	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	011	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WW1						
% SOLIDS	012	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	012	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WW2						
% SOLIDS	013	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	013	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WW3						
% SOLIDS	014	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	014	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WW4						
% SOLIDS	015	S	01L%S132	09/17/01	10/03/01	10/04/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-030 H1507

DATE RECEIVED: 09/20/01

LVL LOT # :0109L884

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	015	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WW5						
% SOLIDS	016	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	016	S	01LVI077	09/17/01	10/08/01	10/08/01
B12WW6						
% SOLIDS	017	S	01L%S132	09/17/01	10/03/01	10/04/01
CHROMIUM VI	017	S	01LVI077	09/17/01	10/08/01	10/08/01

LAB QC:

CHROMIUM VI	MB1	S	01LVI077	N/A	10/08/01	10/08/01
CHROMIUM VI	MB1 BS	S	01LVI077	N/A	10/08/01	10/08/01
CHROMIUM VI	MB1 BSD	S	01LVI077	N/A	10/08/01	10/08/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-030 H1507

DATE RECEIVED: 09/20/01

LVL LOT # :0109L885

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12XB5						
% SOLIDS	001	S	01L%S132	09/18/01	10/03/01	10/04/01
% SOLIDS	001 REP	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	001	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XB6						
% SOLIDS	002	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	002	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XB7						
% SOLIDS	003	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	003	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XB8						
% SOLIDS	004	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	004	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XB9						
% SOLIDS	005	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	005	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XC0						
% SOLIDS	006	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	006	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XC1						
% SOLIDS	007	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	007	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XC2						
% SOLIDS	008	S	01L%S132	09/18/01	10/03/01	10/04/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-030 H1507

DATE RECEIVED: 09/20/01

LVL LOT # :0109L885

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM VI	008	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XC3						
% SOLIDS	009	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	009	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XC4						
% SOLIDS	010	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	010	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XC5						
% SOLIDS	011	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	011	S	01LVI077	09/18/01	10/08/01	10/08/01
CHROMIUM VI	011 REP	S	01LVI077	09/18/01	10/08/01	10/08/01
CHROMIUM VI	011 MS	S	01LVI077	09/18/01	10/08/01	10/08/01
CHROMIUM VI	011 MSD	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XC6						
% SOLIDS	012	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	012	S	01LVI077	09/18/01	10/08/01	10/08/01
B12XC7						
% SOLIDS	013	S	01L%S132	09/18/01	10/03/01	10/04/01
CHROMIUM VI	013	S	01LVI077	09/18/01	10/08/01	10/08/01

LAB QC:

CHROMIUM VI	MB1	S	01LVI077	N/A	10/08/01	10/08/01
CHROMIUM VI	MB1 BS	S	01LVI077	N/A	10/08/01	10/08/01
CHROMIUM VI	MB1 BSD	S	01LVI077	N/A	10/08/01	10/08/01

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B00-030
LVL#: 0109L884
SDG/SAF#: H1507/B00-030

W.O.#: 11343-606-001-9999-00
Date Received: 09-20-01

METALS CASE NARRATIVE

1. This narrative covers the analyses of 17 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. All cooler temperatures have been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits with the exception of the final CCV for Chromium in file TA1004C. Samples B12WW4, B12WW5, and B12WW6 were rerun in file TA1005B. All other samples were reported from the original file as they were surrounded by CCVs in control.

6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).

7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.

8. All ICP Interference Check Standards were within control limits.

9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.

10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit

The results presented in this report relate only to the analytical testing and conditions of the samples at 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 19 pages.

208 Welsh Pool Road • Exton, PA 19341-1313 • (610) 280-3000 • Fax (610) 280-3

(IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.

13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Pat G

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

10-12-01
Date

gmb/m09-884

LVLI
LIONVILLE LABORATORY INC.

METALS METHOD GLOSSARY

The following methods are used as reference for the digestion and analysis of samples contained within this Lot#: 0109L884

Leaching Procedure: __1310 __1311 __1312 __Other:_____

CLP Metals __ Digestion and __ Analysis Methods: __ILM03.0 __ILM04.0

Metals Digestion Methods: __3005A __3010A __3015 __3020A ✓3050B __3051 __200.7 __SS17
__Other: _____

Metals Analysis Methods

	SW846		EPA		STD MTD	EPA OSWR	USATHAMA
Aluminum	__6010B		__200.7				__99
Antimony	__6010B	__7041 [5]	__200.7	__204.2			__99
Arsenic	__6010B	__7060A [5]	__200.7	__206.2	__3113B		__99
Barium	__6010B		__200.7				__99
Beryllium	__6010B		__200.7				__99
Bismuth	__6010B [1]		__200.7 [1]			__1620	__99
Boron	__6010B		__200.7				__99
Cadmium	__6010B	__7131A [5]	__200.7	__213.2			__99
Calcium	__6010B		__200.7				__99
Chromium	✓6010B	__7191 [5]	__200.7	__218.2			__SS17
Cobalt	✓6010B		__200.7				__99
Copper	__6010B	__7211 [5]	__200.7	__220.2			__99
Iron	__6010B		__200.7				__99
Lead	__6010B	__7421 [5]	__200.7	__239.2	__3113B		__99
Lithium	__6010B	__7430 [4]	__200.7			__1620	__99
Magnesium	__6010B		__200.7				__99
Manganese	__6010B		__200.7				__99
Mercury	__7470A [3]	__7471A [3]	__245.1 [2]	__245.5 [2]			__99
Molybdenum	__6010B		__200.7				__99
Nickel	__6010B		__200.7				__99
Potassium	__6010B	__7610 [4]	__200.7	__258.1 [4]			__99
Rare Earths	__6010B [1]		__200.7 [1]			__1620	__99
Selenium	__6010B	__7740 [5]	__200.7	__270.2	__3113B		__99
Silicon	__6010B [1]		__200.7			__1620	__99
Silica	__6010B		__200.7			__1620	__99
Silver	__6010B	__7761 [5]	__200.7	__272.2			__99
Sodium	__6010B	__7770 [4]	__200.7	__273.1 [4]			__99
Strontium	__6010B		__200.7				__99
Thallium	__6010B	__7841 [5]	__200.7	__279.2	__200.9		__99
Tin	__6010B		__200.7				__99
Titanium	__6010B		__200.7				__99
Uranium	__6010B [1]		__200.7 [1]			__1620	__99
Vanadium	__6010B		__200.7				__99
Zinc	__6010B		__200.7				__99
Zirconium	__6010B [1]		__200.7 [1]			__1620	__99

000028

Other:_____ Method:_____

L-WI-033/M-03/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-030 H1507

DATE RECEIVED: 09/20/01 LVL LOT # :0109L884

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12WV0						
COBALT, TOTAL	001	S	01L0645	09/17/01	10/04/01	10/04/01
COBALT, TOTAL	001 REP	S	01L0645	09/17/01	10/04/01	10/04/01
COBALT, TOTAL	001 MS	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	001	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	001 REP	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	001 MS	S	01L0645	09/17/01	10/04/01	10/04/01
B12WV1						
COBALT, TOTAL	002	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	002	S	01L0645	09/17/01	10/04/01	10/04/01
B12WV2						
COBALT, TOTAL	003	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	003	S	01L0645	09/17/01	10/04/01	10/04/01
B12WV3						
COBALT, TOTAL	004	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	004	S	01L0645	09/17/01	10/04/01	10/04/01
B12WV4						
COBALT, TOTAL	005	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	005	S	01L0645	09/17/01	10/04/01	10/04/01
B12WV5						
COBALT, TOTAL	006	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	006	S	01L0645	09/17/01	10/04/01	10/04/01
B12WV6						
COBALT, TOTAL	007	S	01L0645	09/17/01	10/04/01	10/04/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-030 H1507

OCT 2001 RECEIVED

DATE RECEIVED: 09/20/01 LVL LOT # :0109L

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM, TOTAL	007	S	01L0645	09/17/01	10/04/01	10/04/01
B12WV7						
COBALT, TOTAL	008	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	008	S	01L0645	09/17/01	10/04/01	10/04/01
B12WV8						
COBALT, TOTAL	009	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	009	S	01L0645	09/17/01	10/04/01	10/04/01
B12WV9						
COBALT, TOTAL	010	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	010	S	01L0645	09/17/01	10/04/01	10/04/01
B12WW0						
COBALT, TOTAL	011	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	011	S	01L0645	09/17/01	10/04/01	10/04/01
B12WW1						
COBALT, TOTAL	012	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	012	S	01L0645	09/17/01	10/04/01	10/04/01
B12WW2						
COBALT, TOTAL	013	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	013	S	01L0645	09/17/01	10/04/01	10/04/01
B12WW3						
COBALT, TOTAL	014	S	01L0645	09/17/01	10/04/01	10/04/01
CHROMIUM, TOTAL	014	S	01L0645	09/17/01	10/04/01	10/04/01
B12WW4						
COBALT, TOTAL	015	S	01L0645	09/17/01	10/04/01	10/05/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B00-030 H1507

DATE RECEIVED: 09/20/01 LVL LOT # :0109L884

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
CHROMIUM, TOTAL	015	S	01L0645	09/17/01	10/04/01	10/05/01
B12WW5						
COBALT, TOTAL	016	S	01L0645	09/17/01	10/04/01	10/05/01
CHROMIUM, TOTAL	016	S	01L0645	09/17/01	10/04/01	10/05/01
B12WW6						
COBALT, TOTAL	017	S	01L0645	09/17/01	10/04/01	10/05/01
CHROMIUM, TOTAL	017	S	01L0645	09/17/01	10/04/01	10/05/01

LAB QC:

COBALT LABORATORY	LC1 BS	S	01L0645	N/A	10/04/01	10/04/01
COBALT, TOTAL	MB1	S	01L0645	N/A	10/04/01	10/04/01
CHROMIUM LABORATORY	LC1 BS	S	01L0645	N/A	10/04/01	10/04/01
CHROMIUM, TOTAL	MB1	S	01L0645	N/A	10/04/01	10/04/01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B00-030-022	Page 1 of 4
Collector: Stankovich/Nielson	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 8L
Project Designation: 100 F Area - Full Protocol	Sampling Location: 116-F-14		SAF No.: B00-030	Air Quality ☐
Ice Chest No.: ERC 96-030	Field Logbook No.: EL-1535-2	COA: R16F142600	Method of Shipment: Federal Express	Data Turnaround: 21 Days
Shipped To: DSW 09/17/01 ~~TMA~~ RECRA	Offsite Property No.: RSR # 106632		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

LTD QTY Radioactive

Tie All TO B10RL2, B10RL4

Special Handling and/or Storage

SAMPLE ANALYSIS

Preservation	None	Cool 4C	None	None								
Type of Container	aG	aG	aG	P								
No. of Container(s)	1	1	1	1								
Volume	60mL DSW 9/17/01	125mL	250mL	1000mL DSW 9/17/01								
	Strontium-89,90 -- Total Sr; Nickel-63; Carbon-14; ~~Technetium-99~~ RJN 9/14/01	Chromium Hex - 7196	See item (1) in Special Instructions. Chromium Cobalt only	See item (2) in Special Instructions.								
Sample No.	Matrix *	Sample Date	Sample Time									Matrix *
B12WV0	SOIL	09/17/01	0925		X	X						A1
B12WV1	SOIL	09/17/01	0930		X	X						A2
B12WV2	SOIL	09/17/01	0810		X	X						A3
B12WV3	SOIL	09/17/01	0935		X	X						B4
B12WV4	SOIL	09/17/01	0947		X	X						B5

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	9/17/01 1600	Stankovich / IB	9/17/01 1600
Removed from Ref. IB 3728	9-19-01 0700	R Thoe	9-19-01 0700
R Thoe	9-19-01 0700	Fed Ex	
Fed Ex	9.20.01 0915	D Smith	9.20.01 0915

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) ~~(Arsenic,~~ Chromium, Cobalt ~~Lead); Mercury - 7471 (CV)~~ RJN 9/14/01

~~(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ DSW 09/17/01

Samples stored in Ref.# IB at the 3728 Shipping Facility on 9/17/01.
Collector not available to relinquish samples on 9/19/01 for shipment..
RT 9-19-01

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B00-030-022	Page 2 of 4
Collector: Stankovich/Nielson	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 8L / Data Turnaround: 21 Days
Project Designation: 100 F Area - Full Protocol	Sampling Location: 116-F-14		SAF No.: B00-030	Air Quality ☐
Ice Chest No.: ERC.96-0606	Field Logbook No.: EL-1535-2	COA: R16F142600	Method of Shipment: Federal Express	
Shipped To: ~~TMA~~/RECRA DJW 9.17.01	Offsite Property No.: RSR # 106532		Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS
LTD. QTY Radioactive
Tie All TO B10RL2, B10RL6

Special Handling and/or Storage

Preservation	None	Cool 4C	None	None								
Type of Container	sG	sG	sG	P								
No. of Container(s)	1	1	1	1								
Volume	60mL DJW 9.17.01	125mL	250mL	1000mL DJW 9.17.01								
SAMPLE ANALYSIS	Strontium-89,90 -- Total Sr; Nickel-63; Carbon-14; ~~Technetium-99~~ RJN 9/14/01	Chromium Hex - 7196	See item (1) in Special Instructions. Chromium Cobalt only	See item (2) in Special Instructions.								
Sample No.	Matrix *	Sample Date	Sample Time									
B12WV5	SOIL	09/17/01	0820		X	X						B6
B12WV6	SOIL	09/17/01	0940		X	X						C7
B12WV7	SOIL	09/17/01	0950		X	X						C8
B12WV8	SOIL	09/17/01	0840		X	X						C9
B12WV9	SOIL	09/17/01	0910		X	X						D10

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	9-17-01 1600	Stored in 1B	9/17/01 1600
Removed from 1B 3728	9-19-01 0700	R Thorent	9-19-01 0700
R Thorent	9-19-01 0700	ED	
	9.20.01 0915		9.20.01 0915

SPECIAL INSTRUCTIONS
(1) ICP Metals - 6010A (Supertrace) ~~(Arsenic, Chromium, Lead); Mercury - 7471 (CV)~~ Cobalt RJN 9/14/01
~~(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ DJW 9.17.01

Samples stored in Ref.# 1B at the 3728 Shipping Facility on 9/17/01 Collector not available to relinquish samples on 9/19/01 for shipment.
RT 9-19-01

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B00-030-022 | Page 3 of 4

Collector: Stankovich/Nielson	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Project Designation: 100 F Area - Full Protocol	Sampling Location: 116-F-14		SAF No.: B00-030
Ice Chest No.: ERC96-030	Field Logbook No.: EL-1535-2	COA: R16F142600	Method of Shipment: Federal Express
Shipped To: ~~FMA~~ RECRA DSW 09/17/01	Offsite Property No.: RSR # 106532		Bill of Lading/Air Bill No.: NA

Price Code: 8L

Data Turnaround: 21 Days

Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

LTD. QTY Radioactive
Tie all TO B10RL2, B10RL6

Special Handling and/or Storage

Preservation	None	Cool 4C	None	None							
Type of Container	aG	aG	aG	P							
No. of Container(s)	1	1	1	1							
Volume	~~60mL~~ DSW 9/17/01	125mL	250mL	~~1000mL~~ DSW 9-17-01							
SAMPLE ANALYSIS	~~Strontium-89,90 -- Total Sr; Nickel-63; Carbon-14; Technetium-99~~ RJN 9-14-01	Chromium Hex - 7196	See item (1) in Special Instructions. Chromium Cobalt only	See item (2) in Special Instructions.							

Sample No.	Matrix *	Sample Date	Sample Time									
B12WW0	SOIL	09/17/01	0945		X	X						D1
B12WW1	SOIL	09/17/01	0830		X	X						D2
B12WW2	SOIL	09/17/01	0915		X	X						E3
B12WW3	SOIL	09/17/01	0905		X	X						EL
B12WW4	SOIL	09/17/01	0845		X	X						E5

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	9-17-01 1600	Stored in 1B	9-17-01 1600
Removed from 1B 3728	9-19-01 0700	R Thorne	9-17-01 0700
R Thorne	9-17-01 0700	FED EX	
FED EX	9-20-01 0915	Division	9-20-01 0915

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) ~~(Arsenic,~~ Chromium, cobalt ~~Lead); Mercury - 7471 - (CV)~~ 9/14/01 RJN
~~(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ DSW 9-17-01

Samples stored in Ref.# 1B at the 3728
Shipping Facility on 9/17/01.
Collector not available to relinquish samples
on 9/19/01 for shipment..
RT 9-19-01

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B00-030-022

Collector: Stankovich/Nielson	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Price Code: 8L	Data Turnaround: 21 Days	Air Quality ☐	
Project Designation: 100 F Area - Full Protocol	Sampling Location: 116-F-14		SAF No.: B00-030
Ice Chest No.: ERC-96-0660	Field Logbook No.: EL-1535-2	COA: R16F142600	Method of Shipment: Federal Express
Shipped To: ~~TMA/RECRA~~ DSW 9.17.01	Offsite Property No.: RSR# 106532		Bill of Lading/Air Bill No.: N/A

POSSIBLE SAMPLE HAZARDS/REMARKS
LTD QTY Radioactive
TICTO: B10RL2, B10RL6

Special Handling and/or Storage

Preservation	None	Cool 4C	None	None								
Type of Container	aG	aG	aG	P								
No. of Container(s)	1	1	1	1								
Volume	60mL DSW 9.17.01	125mL	250mL	1000mL DSW 9.17.01								
SAMPLE ANALYSIS	Strontium-89,90 - Total Sr; Nickel-63; Carbon-14; ~~Promethium-99~~ RJN 9-14-01	Chromium Hex - 7196	See item (1) in Special Instructions. Chromium Cobalt only	See item (2) in Special Instructions.								
Sample No.	Matrix *	Sample Date	Sample Time									
B12WW5	SOIL	09/17/01	0735		X	X						
B12WW6	SOIL	09/17/01	0820		X	X						

00035

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
Stankovich	9-17-01 1600	Stored in IB	9-17-01 1600
Removed from IB 3728	9-19-01 0700	R Thoren	9-19-01 0700
R Thoren	9-19-01 0700	FED EX	
FED EX	9-20-01 0915	D Johnson	9-20-01 0915

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) ~~(Arsenic~~, Chromium, Cobalt, ~~Lead); Mercury - 7471 - (CV)~~ RJN 9-14-01
~~(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ DSW 9.17.01

Samples stored in Ref.# IB at the 3728 Shipping Facility on 9/17/01.
Collector not available to relinquish samples on 9/19/01 for shipment.
RT 9-19-01

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-030-25	Page 1 of 3

Collector: Stankovich/Nielson/Watson	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Price Code: 8L	Data Turnaround: 21 Days	Air Quality ☐	
Project Designation: 100 F Area - Full Protocol	Sampling Location: 100-F-19	SAF No.: B00-030	
Ice Chest No.: 212C99-063	Field Logbook No.: EL-1535-2	COA: R10F192600	Method of Shipment: FED EX
Shipped To: ~~TMA~~/RECRA DJW 9.18.01	Offsite Property No.: A010439		Bill of Lading/Air Bill No.: 4235195 4-7424

POSSIBLE SAMPLE HAZARDS/REMARKS

TIE TO B12685

Special Handling and/or Storage

000026

Preservation	None	Cool 4C	None									
Type of Container	sG	sG	sG									
No. of Container(s)	1	1	1									
Volume	60mL DJW 9.18.01	125mL	1000mL									
SAMPLE ANALYSIS	Strontium-89,90 – Total Sr; Nickel-63; Carbon-14; ~~Technetium-99~~ DJW 9.18.01	Chromium Hex - 7196	See item (1) in Special Instructions. DJW 9.18.01									

Sample No.	Matrix *	Sample Date	Sample Time										
~~B12XB4~~	~~SOIL~~				—	9/18.0							TIE TO B12685
B12XB5	SOIL	9-18-01	0940		—								
B12XB6	SOIL	9-18-01	0955		✓								
B12XB7	SOIL	9-18-01	0930		✓								
B12XB8	SOIL	9-18-01	0925		✓								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
DS WATSON/TB Watson	9.18.01 1430	Stored in REF. 2C	9.18.01 1430
Removed from 2C 3728	9-19-01 0900	R Thorson	9-19-01 0900
R Thorson	9-19-01 0900	FEDEX	
Fed Ex	9-20-01 0915	[illegible]	9-20-01 0915

SPECIAL INSTRUCTIONS

(1) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ DJW 9.18.01

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 9/18/01. Collector not available to relinquish samples on 9/19/01 for shipment.

RT 9-19-01

Matrix *

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

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

BHI-EE-011 (10/99)

3.5

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B00-030-25	Page 2 of 3

Collector: Stankovich/Nielson/Watson	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ
Project Designation: 100 F Area - Full Protocol	Sampling Location: 100-F-19		SAF No.: B00-030
Ice Chest No.: ERC 99-063	Field Logbook No.: EL-1535-2	COA: R10F192600	Method of Shipment: FED EX
Shipped To: ~~TMA~~ RECRA DJW 9.18.01	Offsite Property No.: A010439		Bill of Lading/Air Bill No.: 4235795 4 - 7424

Price Code: 8L

Air Quality ☐

Data Turnaround: 21 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Tie to B12685

Special Handling and/or Storage

Preservation	None	Cool 4C	None								
Type of Container	sG	sG	sG								
No. of Container(s)	1	1	1								
Volume	60mL	125mL	1000mL								
SAMPLE ANALYSIS	Strontium-89,90 -- Total Sr; Nickel-63; Carbon-14; ~~Technetium-99~~ DJW 9.18.01	Chromium Hex - 7196	See item (1) in Special Instructions DJW 9.18.01								

Sample No.	Matrix *	Sample Date	Sample Time										
B12XB9	SOIL	9-18-01	0900		✓								TIE TO B12685
B12XC0	SOIL	9-18-01	0855		✓								✓
B12XC1	SOIL	9-18-01	0850		✓								
B12XC2	SOIL	9-18-01	0840		✓								
B12XC3	SOIL	9-18-01	0833		✓								

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
DS WATSON/	9.18.01 1430	GARDIN REF. 26	9.18.01 1430
Remove from Ref. 2C 3728	9-19-01 0400	RThore	9-19-01 0400
RThore	9-19-01 0400	FED EX	
FED EX	9-20-01 0915		9-20-01 0915

SPECIAL INSTRUCTIONS

(1) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ DJW 9.18.01

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 9/19/01. Collector not available to relinquish samples on 9/19/01 for shipment.

RT 9-19-01

Matrix *

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

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B00-030-25	Page 3 of 3
Collector: Stankovich/Nielson/Watson	Company Contact: Mike Stankovich	Telephone No.: 531-7620	Project Coordinator: TRENT, SJ	Price Code: 8L
Project Designation: 100 F Area - Full Protocol	Sampling Location: 100-F-19		SAF No.: B00-030	Air Quality ☐
Ice Chest No.: ERC99-003	Field Logbook No.: EL-1535-2	COA: R10F192600	Method of Shipment: FED EX	Data Turnaround: 21 Days
Shipped To: TMA/RECRA DSW 9.18.01	Offsite Property No.: A010439		Bill of Lading/Air Bill No.: 4235795 4 - 7424	

POSSIBLE SAMPLE HAZARDS/REMARKS

TIE TO B12685

Special Handling and/or Storage

B00030

SAMPLE ANALYSIS

Preservation	None	Cool 4C	None							
Type of Container	sG	sG	sG							
No. of Container(s)	1	1	1							
Volume	60mL	125mL	1000mL							
	Strontium-89,90 -- Total Sr; Nickel-63; Carbon-14; Technetium-99 DSW 9.18.01	Chromium Hex - 7196	See item (1) in Special Instructions DSW 9.18.01							
Sample No.	Matrix *	Sample Date	Sample Time							TIE TO 12685
B12XC4	SOIL	9-18-01	0830	✓	✓	✓				
B12XC5	SOIL	9-18-01	0820	✓	✓	✓				
B12XC6	SOIL	9-18-01	0805	✓	✓	✓				
B12XC7	SOIL	9-18-01	0820	✓	✓	✓				
				MA	9-18-01					

CHAIN OF POSSESSION

Relinquished By (Sign/Print Names)	Date/Time	Received By (Sign/Print Names)	Date/Time
DS Watson	9.18.01 1430	REF 2C	9-18-01 1430
Ref 2C Remove from 3728	9-19-01 0900	R. R Thoren	9-19-01 0900
R R Thoren	9-19-01 0900	FEDEX	
FedEx	9-20-01 0915	V. Hernandez	9-20-01 0915
FedEx	9-20-01 0915	V. Hernandez	9-20-01 0915
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)~~ DSW 9.18.01

Samples stored in Ref.# 2C at the 3728 Shipping Facility on 9-18-01. Collector not available to relinquish samples on 9-18-01 for shipment.

RT 9-19-01

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

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

BHI-EE-011 (10/99)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 100-F-19/19		DATA PACKAGE: H1507	
VALIDATOR: TLI	LAB: LLI	DATE: 3Dec01	
CASE:		SDG: H1507	

ANALYSES PERFORMED

☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☒ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☒ CRVI	☐

SAMPLES/MATRIX B12W00 B12WV1 B12WV2 B12WV3 B12WV4
B12WV5 B12WV6 B12WV7 B12WV8 B12WV9 B12W000 B12W001
B12W002 B12W003 B12W004 B12W005 B12W006 B12XB5 B12XB6
B12XB7 B12XB8 B12XB9 B12XC0 B12XC1 B12XC2 B12XC3
B12XC4 B12XC5 B12XC6 B12XC7
Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No ~~N/A~~

Comments: Cr (total) in FB

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A

Comments: MS - insol CRDT 142.3 ~J all

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A
Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A
Were ICP serial dilution samples analyzed? . . . . . Yes No N/A
Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A

Comments:

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A
Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A
Were analytical spikes performed as required? . . . . . Yes No N/A
Are analytical spike recoveries acceptable? . . . . . Yes No N/A
Was MSA performed as required? . . . . . Yes No N/A
Are MSA results acceptable? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A
Are all results supported in the raw data? . . . . . Yes No N/A
Are results calculated properly? . . . . . Yes No N/A
Do results meet the CRDLs? . . . . . Yes No N/A

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/09/01

CLIENT: TNUHANFORD B00-030 H1507 LVL LOT #: 0109L884

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0645-MB1	Cobalt, Total	0.09 u	MG/KG	0.09	1.0
		Chromium, Total	0.14 u	MG/KG	0.14	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507

WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0109L884

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B12WV0	Cobalt, Total	52.1	4.2	50.0	95.8	1.0
		Chromium, Total	98.7	77.1	20.0	108.0	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507

LVL LOT #: 0109L884

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B12WV0	Cobalt, Total	4.2	4.4	4.7	1.0
		Chromium, Total	77.1	69.0	11.1	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/09/01

CLIENT: TNUHANFORD B00-030 H1507

LVL LOT #: 0109L884

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LVI077-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507

LVL LOT #: 0109L884

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B12WV0	Soluble Chromium VI	9.2	5.5	4.0	92.5	1.0
		Insoluble Chromium VI	1930	5.5	1350	142.3	100
BLANK10	01LVI077-MB1	Soluble Chromium VI	3.8	0.40u	4.0	93.9	1.0
		Insoluble Chromium VI	1480	0.40u	1160	127.3	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507

LVL LOT #: 0109L884

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B12WV0	% Solids	99.9	99.9	0.020	1.0
		Chromium VI	5.5	6.1	10.8	1.0

18

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/09/01

CLIENT: TNUHANFORD B00-030 H1507

LVL LOT #: 0109L885

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LVI077-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

16

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507 LVL LOT #: 0109L885

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-011	B12XC5	Soluble Chromium VI	3.1	0.41u	4.1	70.1	1.0
		Insoluble Chromium VI	954	0.41u	785	121.6	100
BLANK10	01LVI077-MB1	Soluble Chromium VI	3.8	0.40u	4.0	93.9	1.0
		Insoluble Chromium VI	1480	0.40u	1160	127.3	100

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/09/01

CLIENT: TNUHANFORD B00-030 H1507

LVL LOT #: 0109L885

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B12XB5	% Solids	99.7	99.8	0.10	1.0
-011REP	B12XC5	Chromium VI	0.41u	0.41u	NC	1.0