H1488

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Date: 12 January 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-NR-1 TSD Sites R.A. Verification Sampling - Soil - Waste Site 116-N-3
Subject: Radiochemistry - Data Package No. H1488-EB (SDG No. H1488)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1488-EB prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
B12P74	8/24/01	Soil	C	See note 1
B12P75	8/27/01	Soil	C	See note 1
B12P76	8/27/01	Soil	C	See note 1
B12P77	8/27/01	Soil	C	See note 1
B12P78	8/27/01	Soil	C	See note 1
B12P79	8/27/01	Soil	C	See note 1
B12P80	8/24/01	Soil	C	See note 1
B12P81	8/24/01	Soil	C	See note 1
B12P82	8/24/01	Soil	C	See note 1
B12P83	8/24/01	Soil	C	See note 1
B12P84	8/24/01	Soil	C	See note 1
B12P85	8/24/01	Soil	C	See note 1
B12P86	8/24/01	Soil	C	See note 2
B12P87	8/27/01	Soil	C	See note 2
B12P88	8/24/01	Soil	C	See note 2
B12P89	8/27/01	Soil	C	See note 2
B12P90	8/27/01	Soil	C	See note 2
B12P91	8/27/01	Soil	C	See note 2
B12P92	8/24/01	Soil	C	See note 2
B12P93	8/27/01	Soil	C	See note 2
B12P94	8/24/01	Soil	C	See note 2
B12P95	8/24/01	Soil	C	See note 2
B12P96	8/24/01	Soil	C	See note 2

1 - Gamma spectroscopy; total strontium; isotopic plutonium; americium-241; nickel-63; tritium.
2 - Total strontium; isotopic plutonium; americium-241; nickel-63; tritium.

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 Blank

  One field blank was submitted for analysis (B12P77). Potassium-40, radium-226, radium-228, thorium-228 and thorium-232 were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **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.

All 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.

<u>Field Duplicate</u>

One set of field duplicates (B12P75/B12P76) 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. Seventy out of three-hundred and four analytes were reported

above the TDL. 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. H1488-EB 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

None found.

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: H1488	REVIEWER: TLI	DATE: 1/12/02	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																							
Laboratory: EB																							
Case	SDG: H1488																						
Sample Number		B12P74		B12P75		B12P76		B12P77		B12P78		B12P79		B12P80		B12P81		B12P82		B12P83			
Location																							
Sample Date		8/24/01		8/27/01		8/27/01		8/27/01		8/27/01		8/27/01		8/24/01		8/24/01		8/24/01		8/24/01			
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Gross Alpha	200	NA		NA		NA		NA		NA		NA		NA		1.68	U	2.64	U	7.06			
Gross Beta	200	NA		NA		NA		NA		NA		NA		NA		10.0	J	94.8		26.7			
Tritium		-0.014	U	0.042	U	-0.053	U	-0.107	U	-0.034	U	-0.043	U	-0.030	U	-0.066	U	-0.098	U	-0.102	U		
Nickel-63	30	-1.67	U	-2.69	U	-3.08	U	-1.32	U	-1.80	U	-1.07	U	-1.60	U	-4.26	U	-2.27	U	3.20	U		
Strontium (total)	1	-0.071	U	0.368		0.042	U	-0.037	U	-0.001	U	-0.056	U	0.017	U	0.046	U	47.3		0.452	U		
Americium-241	0.1	0.387	U*	0	U*	0.324	U*	0.024	U*	-0.129	U*	-0.053	U*	0.260	U*	-0.130	U*	0.094	U*	0.683	U*		
Plutonium-238	0.1	0	U*	0.137	U*	0.195	U*	-0.119	U*	0	U*	0	U*	0	U*	0	U*	-0.109	U*	0.475	U*		
Plutonium-239/240	0.1	-0.114	U*	0.137	U*	0.097	U*	0	U*	0	U*	0	U*	-0.111	U*	0	U*	0	U*	0	U*		
Potassium-40		8.77		11.0		9.83		4.74		10.7		9.17		10.6		8.06		9.66		10.5			
Cobalt 60	0.05	U	U	0.037		0.044		U	U	0.265		0.033		0.013	U	0.062		0.601		20.6			
Cesium 137	0.05	U	U	0.033		0.032		U	U	0.151		U	U	U	U	U	U	1.37		3.74			
Radium-226		0.349		0.398		0.366		0.166		0.410		0.365		0.434		0.324		0.312		0.392			
Radium-228		0.501		0.544		0.504		0.196		0.646		0.509		0.582		0.716		0.494		0.681			
Europium 152	0.1	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	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	0.1	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U*	U	U*		
Thorium-228		0.548		0.525		0.483		0.218		0.526		0.429		0.568		0.440		0.514		0.582			
Thorium-232		0.501		0.544		0.504		0.196		0.646		0.509		0.582		0.716		0.494		0.681			
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 (GEA)	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.

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																						
Laboratory: EB																						
Case	SDG: H1488																					
Sample Number		B12P84		B12P85		B12P86		B12P87		B12P88		B12P89		B12P90		B12P91		B12P92		B12P93		
Remarks																						
Sample Date		8/24/01		8/24/01		8/24/01		8/27/01		8/24/01		8/27/01		8/27/01		8/27/01		8/24/01		8/27/01		
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Gross Alpha	200	2.98	U	2.00	U	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Gross Beta	200	15.0		3.52	U	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Tritium		-0.066	U	-0.030	U	-0.004	U	-0.026	U	0.027	U	0.031	U	0.109	U	0.129	U	0.032	U	-0.091	U	
Nickel-63	30	0.475	U	-2.14	U	2.18	U	227		5.26	U	53.6		50.0		112		5.35	U	279		
Strontium (total)	1	0.100	U	1.14		107		292		69.2		72.5		70.0		237		60.4		83.4		
Americium-241	0.1	0.121	U*	0.312	U*	0.207		21.2		0.222		3.84		2.51		10.1		0.080	U*	18.0		
Plutonium-238	0.1	-0.091	U*	0.114	U*	0	U*	4.21		0	U*	1.48		0.992		1.40		0	U*	4.86		
Plutonium-239/240	0.1	-0.091	U*	0	U*	0.199	U*	26.1		0.172	U*	7.13		8.55		15.0		0.082	U*	29.2		
Potassium-40		9.18		8.10		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Cobalt 60	0.05	U	U	0.205		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Cesium 137	0.05	U	U	0.200		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Radium-226		U	U	0.372		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Radium-228		0.477		0.387		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Europium 152	0.1	U	U	U	U	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Europium 154	0.1	U	U	U	U*	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Europium 155	0.1	U	U	U	U	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Thorium-228		0.589		0.423		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Thorium-232		0.477		0.387		N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Uranium-235	0.1	U	U	U	U*	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Uranium-238	0.1	U	U*	U	U*	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		
Americium-241 (GEA)	0.1	U	U	U	U	N/A		N/A		N/A		N/A		N/A		N/A		N/A		N/A		

* - 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: H1488																				
Sample Number		B12P94		B12P95		B12P96															
Remarks																					
Sample Date		8/24/01		8/24/01		8/24/01															
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	200	N/A		N/A		N/A															
Gross Beta	200	N/A		N/A		N/A															
Tritium		-0.012	U	-0.022	U	0.069	U														
Nickel-63	30	43.8		3.06	U	-26.9	U														
Strontium (total)	1	499		386		-0.138	U														
Americium-241	0.1	6.51		0.394		-0.024	U*														
Plutonium-238	0.1	1.47		0.051	U*	0	U*														
Plutonium-239/240	0.1	11.8		0.230		0.047	U*														
Potassium-40		N/A		N/A		N/A															
Cobalt 60	0.05	N/A		N/A		N/A															
Cesium 137	0.05	N/A		N/A		N/A															
Radium-226		N/A		N/A		N/A															
Radium-228		N/A		N/A		N/A															
Europium 152	0.1	N/A		N/A		N/A															
Europium 154	0.1	N/A		N/A		N/A															
Europium 155	0.1	N/A		N/A		N/A															
Thorium-228		N/A		N/A		N/A															
Thorium-232		N/A		N/A		N/A															
Uranium-235	0.1	N/A		N/A		N/A															
Uranium-238	0.1	N/A		N/A		N/A															
Americium-241	0.1	N/A		N/A		N/A															

* - 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 H1488

R109039-01 B12P74

DATA SHEET

SDG	7074	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-01	Client sample id	B12P74
Dept sample id	7074-001	Location/Matrix	116-N-3 Trench-Shallow SOLID
Received	09/06/01	Collected/Weight	08/24/01 10:00 1530 g
% solids	97.5	Custody/SAF No	B01-090-001 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.014	0.060	0.10	400	U	H
Nickel 63	13981-37-8	-1.67	6.8	12	30	U	NI_L
Total Strontium	SR-RAD	-0.071	0.13	0.17	1.0	U	SR
Americium 241	14596-10-2	0.387	1.0	1.7	1.0	U	AM
Plutonium 238	13981-16-3	0	0.23	0.87	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.114	0.23	0.87	1.0	U	PU
Potassium 40	13966-00-2	8.77	0.24	0.086			GAM
Cobalt 60	10198-40-0	U		0.012	0.050	U	GAM
Cesium 137	10045-97-3	U		0.011	0.10	U	GAM
Radium 226	13982-63-3	0.349	0.022	0.020	0.10		GAM
Radium 228	15262-20-1	0.501	0.050	0.046	0.20		GAM
Europium 152	14683-23-9	U		0.025	0.10	U	GAM
Europium 154	15585-10-1	U		0.036	0.10	U	GAM
Europium 155	14391-16-3	U		0.047	0.10	U	GAM
Thorium 228	14274-82-9	0.548	0.024	0.022			GAM
Thorium 232	TH-232	0.501	0.050	0.046			GAM
Uranium 235	15117-96-1	U		0.045		U	GAM
Uranium 238	U-238	U		1.4		U	GAM
Americium 241	14596-10-2	U		0.034		U	GAM

100-NR-1 TSD Sites RA Ver Smpg-Soil

11/12/02

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 H1488

R109039-02 B12P75

DATA SHEET

SDG	7074	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-02	Client sample id	B12P75
Dept sample id	7074-002	Location/Matrix	116-N-3 Trench-Shallow SOLID
Received	09/06/01	Collected/Weight	08/27/01 10:15 1838 g
% solids	99.1	Custody/SAF No	B01-090-001 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.042	0.063	0.10	400	U	H
Nickel 63	13981-37-8	-2.69	6.1	10	30	U	NI_L
Total Strontium	SR-RAD	0.368	0.15	0.18	1.0	J	SR
Americium 241	14596-10-2	0	0.68	1.6	1.0	U	AM
Plutonium 238	13981-16-3	0.137	0.27	1.0	1.0	U	PU
Plutonium 239/240	PU-239/240	0.137	0.55	1.0	1.0	U	PU
Potassium 40	13966-00-2	11.0	0.73	0.13			GAM
Cobalt 60	10198-40-0	0.037	0.014	0.015	0.050	J	GAM
Cesium 137	10045-97-3	0.033	0.013	0.015	0.10	J	GAM
Radium 226	13982-63-3	0.398	0.033	0.026	0.10		GAM
Radium 228	15262-20-1	0.544	0.066	0.059	0.20		GAM
Europium 152	14683-23-9	U		0.028	0.10	U	GAM
Europium 154	15585-10-1	U		0.043	0.10	U	GAM
Europium 155	14391-16-3	U		0.037	0.10	U	GAM
Thorium 228	14274-82-9	0.525	0.022	0.016			GAM
Thorium 232	TH-232	0.544	0.066	0.059			GAM
Uranium 235	15117-96-1	U		0.045		U	GAM
Uranium 238	U-238	U		1.5		U	GAM
Americium 241	14596-10-2	U		0.017		U	GAM

100-NR-1 TSD Sites RA Ver Smpg-Soil

11/12/02

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 H1488

R109039-03 B12P76

DATA SHEET

SDG	7074	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-03	Client sample id	B12P76
Dept sample id	7074-003	Location/Matrix	116-N-3 Trench-Shallow SOLID
Received	09/06/01	Collected/Weight	08/27/01 10:15 1890 g
% solids	99.1	Custody/SAF No	B01-090-001 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.053	0.057	0.099	400	U	H
Nickel 63	13981-37-8	-3.08	5.7	9.8	30	U	NI_L
Total Strontium	SR-RAD	0.042	0.12	0.16	1.0	U	SR
Americium 241	14596-10-2	0.324	0.97	1.6	1.0	U	AM
Plutonium 238	13981-16-3	0.195	0.59	1.1	1.0	U	PU
Plutonium 239/240	PU-239/240	0.097	0.39	0.75	1.0	U	PU
Potassium 40	13966-00-2	9.83	0.34	0.20			GAM
Cobalt 60	10198-40-0	0.044	0.019	0.020	0.050	J	GAM
Cesium 137	10045-97-3	0.032	0.017	0.019	0.10	J	GAM
Radium 226	13982-63-3	0.366	0.035	0.034	0.10		GAM
Radium 228	15262-20-1	0.504	0.076	0.077	0.20		GAM
Europium 152	14683-23-9	U		0.039	0.10	U	GAM
Europium 154	15585-10-1	U		0.058	0.10	U	GAM
Europium 155	14391-16-3	U		0.041	0.10	U	GAM
Thorium 228	14274-82-9	0.483	0.020	0.021			GAM
Thorium 232	TH-232	0.504	0.076	0.077			GAM
Uranium 235	15117-96-1	U		0.063		U	GAM
Uranium 238	U-238	U		2.0		U	GAM
Americium 241	14596-10-2	U		0.061		U	GAM

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SAMPLE DELIVERY GROUP H1488

R109039-04 B12P77

DATA SHEET

SDG	7074	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-04	Client sample id	B12P77
Dept sample id	7074-004	Location/Matrix	116-N-3 Trench-Shallow SOLID
Received	09/06/01	Collected/Weight	08/27/01 09:15 1556 g
% solids	100.0	Custody/SAF No	B01-090-001 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.107	0.055	0.099	400	U	H
Nickel 63	13981-37-8	-1.32	1.1	1.9	30	U	NI_L
Total Strontium	SR-RAD	-0.037	0.14	0.19	1.0	U	SR
Americium 241	14596-10-2	0.024	0.048	0.18	1.0	U	AM
Plutonium 238	13981-16-3	-0.119	0.24	0.91	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.24	0.91	1.0	U	PU
Potassium 40	13966-00-2	4.74	0.18	0.072			GAM
Cobalt 60	10198-40-0	U		0.009	0.050	U	GAM
Cesium 137	10045-97-3	U		0.008	0.10	U	GAM
Radium 226	13982-63-3	0.166	0.018	0.016	0.10		GAM
Radium 228	15262-20-1	0.196	0.031	0.030	0.20	J	GAM
Europium 152	14683-23-9	U		0.020	0.10	U	GAM
Europium 154	15585-10-1	U		0.028	0.10	U	GAM
Europium 155	14391-16-3	U		0.021	0.10	U	GAM
Thorium 228	14274-82-9	0.218	0.016	0.015			GAM
Thorium 232	TH-232	0.196	0.031	0.030			GAM
Uranium 235	15117-96-1	U		0.033		U	GAM
Uranium 238	U-238	U		1.0		U	GAM
Americium 241	14596-10-2	U		0.026		U	GAM

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SAMPLE DELIVERY GROUP H1488

R109039-05 B12P78

DATA SHEET

SDG	7074	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-05	Client sample id	B12P78
Dept sample id	7074-005	Location/Matrix	116-N-3 Trench-Shallow SOLID
Received	09/06/01	Collected/Weight	08/27/01 10:06 2027 g
% solids	98.8	Custody/SAF No	B01-090-001 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.034	0.060	0.10	400	U	H
Nickel 63	13981-37-8	-1.80	5.8	9.9	30	U	NI_L
Total Strontium	SR-RAD	-0.001	0.13	0.18	1.0	U	SR
Americium 241	14596-10-2	-0.129	0.26	0.48	1.0	U	AM
Plutonium 238	13981-16-3	0	0.23	0.88	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.23	0.88	1.0	U	PU
Potassium 40	13966-00-2	10.7	0.34	0.16			GAM
Cobalt 60	10198-40-0	0.265	0.023	0.020	0.050		GAM
Cesium 137	10045-97-3	0.151	0.018	0.019	0.10		GAM
Radium 226	13982-63-3	0.410	0.032	0.032	0.10		GAM
Radium 228	15262-20-1	0.646	0.064	0.067	0.20		GAM
Europium 152	14683-23-9	U		0.037	0.10	U	GAM
Europium 154	15585-10-1	U		0.052	0.10	U	GAM
Europium 155	14391-16-3	U		0.072	0.10	U	GAM
Thorium 228	14274-82-9	0.526	0.018	0.019			GAM
Thorium 232	TH-232	0.646	0.064	0.067			GAM
Uranium 235	15117-96-1	U		0.071		U	GAM
Uranium 238	U-238	U		2.2		U	GAM
Americium 241	14596-10-2	U		0.13		U	GAM

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SAMPLE DELIVERY GROUP H1488

R109039-06 B12P79

DATA SHEET

SDG	7074	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-06	Client sample id	B12P79
Dept sample id	7074-006	Location/Matrix	116-N-3 Trench-Shallow SOLID
Received	09/06/01	Collected/Weight	08/27/01 10:35 1547 g
% solids	98.3	Custody/SAF No	B01-090-001 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.043	0.051	0.089	400	U	H
Nickel 63	13981-37-8	-1.07	5.5	9.3	30	U	NI_L
Total Strontium	SR-RAD	-0.056	0.14	0.18	1.0	U	SR
Americium 241	14596-10-2	-0.053	0.25	0.43	1.0	U	AM
Plutonium 238	13981-16-3	0	0.20	0.77	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.20	0.77	1.0	U	PU
Potassium 40	13966-00-2	9.17	0.26	0.11			GAM
Cobalt 60	10198-40-0	0.033	0.012	0.013	0.050	J	GAM
Cesium 137	10045-97-3	U		0.011	0.10	U	GAM
Radium 226	13982-63-3	0.365	0.024	0.023	0.10		GAM
Radium 228	15262-20-1	0.509	0.052	0.050	0.20		GAM
Europium 152	14683-23-9	U		0.027	0.10	U	GAM
Europium 154	15585-10-1	U		0.041	0.10	U	GAM
Europium 155	14391-16-3	U		0.038	0.10	U	GAM
Thorium 228	14274-82-9	0.429	0.014	0.014			GAM
Thorium 232	TH-232	0.509	0.052	0.050			GAM
Uranium 235	15117-96-1	U		0.048		U	GAM
Uranium 238	U-238	U		1.5		U	GAM
Americium 241	14596-10-2	U		0.094		U	GAM

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SAMPLE DELIVERY GROUP H1488

R109039-07 B12P80

DATA SHEET

SDG	7074	Client/Case no	Hanford SDG_H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-07	Client sample id	B12P80
Dept sample id	7074-007	Location/Matrix	116-N-3 Trench-Shallow SOLID
Received	09/06/01	Collected/Weight	08/24/01 09:40 1744 g
% solids	97.9	Custody/SAF No	B01-090-001 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.030	0.058	0.10	400	U	H
Nickel 63	13981-37-8	-1.60	5.4	9.3	30	U	NI_L
Total Strontium	SR-RAD	0.017	0.13	0.17	1.0	U	SR
Americium 241	14596-10-2	0.260	0.52	1.0	1.0	U	AM
Plutonium 238	13981-16-3	0	0.22	0.85	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.111	0.22	0.85	1.0	U	PU
Potassium 40	13966-00-2	10.6	0.75	0.12			GAM
Cobalt 60	10198-40-0	0.013	0.013	0.015	0.050	U	GAM
Cesium 137	10045-97-3	U		0.025	0.10	U	GAM
Radium 226	13982-63-3	0.434	0.033	0.025	0.10		GAM
Radium 228	15262-20-1	0.582	0.066	0.057	0.20		GAM
Europium 152	14683-23-9	U		0.029	0.10	U	GAM
Europium 154	15585-10-1	U		0.042	0.10	U	GAM
Europium 155	14391-16-3	U		0.028	0.10	U	GAM
Thorium 228	14274-82-9	0.568	0.022	0.016			GAM
Thorium 232	TH-232	0.582	0.066	0.057			GAM
Uranium 235	15117-96-1	U		0.067		U	GAM
Uranium 238	U-238	U		1.5		U	GAM
Americium 241	14596-10-2	U		0.017		U	GAM

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SAMPLE DELIVERY GROUP H1488

R109039-08 B12P81

DATA SHEET

SDG	7074	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-08	Client sample id	B12P81
Dept sample id	7074-008	Location/Matrix	116-N-3 Trench-Shallow SOLID
Received	09/06/01	Collected/Weight	08/24/01 14:20 1838 g
% solids	98.1	Custody/SAF No	B01-090-001 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	1.68	2.7	4.1	10	U	93A
Gross Beta	12587-47-2	10.0	4.3	6.4	15	J	93B
Tritium	10028-17-8	-0.066	0.051	0.089	400	U	H
Nickel 63	13981-37-8	-4.26	5.6	9.7	30	U	NI_L
Total Strontium	SR-RAD	0.046	0.25	0.51	1.0	U	SR
Americium 241	14596-10-2	-0.130	0.26	0.99	1.0	U	AM
Plutonium 238	13981-16-3	0	0.22	0.86	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.22	0.86	1.0	U	PU
Potassium 40	13966-00-2	8.06	0.70	0.38			GAM
Cobalt 60	10198-40-0	0.062	0.034	0.036	0.050		GAM
Cesium 137	10045-97-3	U		0.033	0.10	U	GAM
Radium 226	13982-63-3	0.324	0.071	0.070	0.10		GAM
Radium 228	15262-20-1	0.716	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		0.15	0.10	U	GAM
Europium 155	14391-16-3	U		0.067	0.10	U	GAM
Thorium 228	14274-82-9	0.440	0.039	0.036			GAM
Thorium 232	TH-232	0.716	0.17	0.16			GAM
Uranium 235	15117-96-1	U		0.10		U	GAM
Uranium 238	U-238	U		4.3		U	GAM
Americium 241	14596-10-2	U		0.042		U	GAM

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SAMPLE DELIVERY GROUP H1488

R109039-09 B12P82

DATA SHEET

SDG	7074	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-09	Client sample id	B12P82
Dept sample id	7074-009	Location/Matrix	116-N-3 Trench-Shallow SOLID
Received	09/06/01	Collected/Weight	08/24/01 14:45 1857 g
% solids	99.2	Custody/SAF No	B01-090-001 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	2.64	3.4	4.1	10	U	93A
Gross Beta	12587-47-2	94.8	7.5	6.4	15		93B
Tritium	10028-17-8	-0.098	0.059	0.10	400	U	H
Nickel 63	13981-37-8	-2.27	5.8	9.9	30	U	NI_L
Total Strontium	SR-RAD	47.3	2.7	1.2	1.0		SR
Americium 241	14596-10-2	0.094	0.38	0.72	1.0	U	AM
Plutonium 238	13981-16-3	-0.109	0.22	0.83	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.22	0.83	1.0	U	PU
Potassium 40	13966-00-2	9.66	0.48	0.23			GAM
Cobalt 60	10198-40-0	0.601	0.047	0.031	0.050		GAM
Cesium 137	10045-97-3	1.37	0.050	0.033	0.10		GAM
Radium 226	13982-63-3	0.312	0.046	0.048	0.10		GAM
Radium 228	15262-20-1	0.494	0.13	0.14	0.20		GAM
Europium 152	14683-23-9	U		0.067	0.10	U	GAM
Europium 154	15585-10-1	U		0.075	0.10	U	GAM
Europium 155	14391-16-3	U		0.090	0.10	U	GAM
Thorium 228	14274-82-9	0.514	0.034	0.037			GAM
Thorium 232	TH-232	0.494	0.13	0.14			GAM
Uranium 235	15117-96-1	U		0.12		U	GAM
Uranium 238	U-238	U		3.6		U	GAM
Americium 241	14596-10-2	U		0.10		U	GAM

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SAMPLE DELIVERY GROUP H1488

R109039-10 B12P83

DATA SHEET

SDG	7074	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-10	Client sample id	B12P83
Dept sample id	7074-010	Location/Matrix	116-N-3 Trench-Shallow SOLID
Received	09/06/01	Collected/Weight	08/24/01 13:50 1727 g
% solids	98.8	Custody/SAF No	B01-090-001 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	7.06	4.0	4.1	10	J	93A
Gross Beta	12587-47-2	26.7	5.8	7.8	15		93B
Tritium	10028-17-8	-0.102	0.051	0.091	400	U	H
Nickel 63	13981-37-8	3.20	5.9	9.8	30	U	NI_L
Total Strontium	SR-RAD	0.452	0.30	0.52	1.0	U	SR
Americium 241	14596-10-2	0.683	0.55	1.0	1.0	U	AM
Plutonium 238	13981-16-3	0.475	0.38	0.73	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.19	0.73	1.0	U	PU
Potassium 40	13966-00-2	10.5	0.77	0.51			GAM
Cobalt 60	10198-40-0	20.6	0.28	0.093	0.050		GAM
Cesium 137	10045-97-3	3.74	0.14	0.13	0.10		GAM
Radium 226	13982-63-3	0.392	0.15	0.19	0.10		GAM
Radium 228	15262-20-1	0.681	0.46	0.61	0.20		GAM
Europium 152	14683-23-9	U		0.22	0.10	U	GAM
Europium 154	15585-10-1	U		0.23	0.10	U	GAM
Europium 155	14391-16-3	U		0.23	0.10	U	GAM
Thorium 228	14274-82-9	0.582	0.12	0.16			GAM
Thorium 232	TH-232	0.681	0.46	0.61			GAM
Uranium 235	15117-96-1	U		0.26		U	GAM
Uranium 238	U-238	U		18		U	GAM
Americium 241	14596-10-2	U		0.51		U	GAM

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SAMPLE DELIVERY GROUP H1488

R109039-11

B12P84

DATA SHEET

SDG	7074	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-11	Client sample id	B12P84
Dept sample id	7074-011	Location/Matrix	116-N-3 Trench-Shallow SOLID
Received	09/06/01	Collected/Weight	08/24/01 14:30 1809 g
% solids	98.3	Custody/SAF No	B01-090-001 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	2.98	2.7	3.2	10	U	93A
Gross Beta	12587-47-2	15.0	4.5	6.3	15		93B
Tritium	10028-17-8	-0.066	0.060	0.10	400	U	H
Nickel 63	13981-37-8	0.475	5.9	9.9	30	U	NI_L
Total Strontium	SR-RAD	0.100	0.35	0.69	1.0	U	SR
Americium 241	14596-10-2	0.121	0.24	0.93	1.0	U	AM
Plutonium 238	13981-16-3	-0.091	0.18	0.70	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.091	0.18	0.70	1.0	U	PU
Potassium 40	13966-00-2	9.18	0.71	0.20			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	U		0.075	0.10	U	GAM
Radium 228	15262-20-1	0.477	0.095	0.088	0.20		GAM
Europium 152	14683-23-9	U		0.054	0.10	U	GAM
Europium 154	15585-10-1	U		0.080	0.10	U	GAM
Europium 155	14391-16-3	U		0.051	0.10	U	GAM
Thorium 228	14274-82-9	0.589	0.045	0.044			GAM
Thorium 232	TH-232	0.477	0.095	0.088			GAM
Uranium 235	15117-96-1	U		0.080		U	GAM
Uranium 238	U-238	U		2.7		U	GAM
Americium 241	14596-10-2	U		0.029		U	GAM

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SAMPLE DELIVERY GROUP H1488

R109039-12 B12P85

DATA SHEET

SDG	7074	Client/Case no	Hanford	SDG H1488	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109039-12	Client sample id	B12P85		
Dept sample id	7074-012	Location/Matrix	116-N-3 Trench-Shallow	SOLID	
Received	09/06/01	Collected/Weight	08/24/01 14:00	1689 g	
% solids	98.3	Custody/SAF No	B01-090-001	B01-090	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	2.00	3.0	4.5	10	U	93A
Gross Beta	12587-47-2	3.52	5.6	9.3	15	U	93B
Tritium	10028-17-8	-0.030	0.054	0.092	400	U	H
Nickel 63	13981-37-8	-2.14	5.7	9.7	30	U	NI_L
Total Strontium	SR-RAD	1.14	0.43	0.63	1.0		SR
Americium 241	14596-10-2	0.312	0.47	0.60	1.0	U	AM
Plutonium 238	13981-16-3	0.114	0.23	0.87	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.23	0.87	1.0	U	PU
Potassium 40	13966-00-2	8.10	0.68	0.30			GAM
Cobalt 60	10198-40-0	0.205	0.055	0.046	0.050		GAM
Cesium 137	10045-97-3	0.200	0.046	0.044	0.10		GAM
Radium 226	13982-63-3	0.372	0.061	0.056	0.10		GAM
Radium 228	15262-20-1	0.387	0.18	0.20	0.20		GAM
Europium 152	14683-23-9	U		0.081	0.10	U	GAM
Europium 154	15585-10-1	U		0.13	0.10	U	GAM
Europium 155	14391-16-3	U		0.067	0.10	U	GAM
Thorium 228	14274-82-9	0.423	0.037	0.037			GAM
Thorium 232	TH-232	0.387	0.18	0.20			GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		5.3		U	GAM
Americium 241	14596-10-2	U		0.042		U	GAM

100-NR-1 TSD Sites RA Ver Smpg-Soil

1/12/02

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

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-01

B12P86

DATA SHEET

SDG	7075	Client/Case no	Hanford	SDG H1488	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109040-01	Client sample id	B12P86		
Dept sample id	7075-001	Location/Matrix	116-N-3 Trench-Deep Zone	SOLID	
Received	09/06/01	Collected/Weight	08/24/01 09:30	1598 g	
% solids	97.5	Custody/SAF No	B01-090-002	B01-090	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.004	0.053	0.091	400	U	H
Nickel 63	13981-37-8	2.18	6.3	11	30	U	NI_L
Total Strontium	SR-RAD	107	1.1	0.17	1.0		SR
Americium 241	14596-10-2	0.207	0.16	0.20	1.0	J	AM
Plutonium 238	13981-16-3	0	0.080	0.30	1.0	U	PU
Plutonium 239/240	PU-239/240	0.199	0.16	0.30	1.0	U	PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

BV
11/12/02

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-02

B12P87

DATA SHEET

SDG	7075	Client/Case no	Hanford	SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R109040-02	Client sample id	B12P87	
Dept sample id	7075-002	Location/Matrix	116-N-3 Trench-Deep Zone	SOLID
Received	09/06/01	Collected/Weight	08/27/01 10:45	1907 g
% solids	98.8	Custody/SAF No	B01-090-002	B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.026	0.20	0.35	400	U	H
Nickel 63	13981-37-8	227	11	10	30		NI_L
Total Strontium	SR-RAD	292	6.0	1.7	1.0		SR
Americium 241	14596-10-2	21.2	3.6	0.96	1.0		AM
Plutonium 238	13981-16-3	4.21	1.5	1.1	1.0		PU
Plutonium 239/240	PU-239/240	26.1	4.3	1.1	1.0		PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

1/12/02

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-03

B12P88

DATA SHEET

SDG	7075	Client/Case no	Hanford	SDG H1488	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109040-03	Client sample id	B12P88		
Dept sample id	7075-003	Location/Matrix	116-N-3 Trench-Deep Zone	SOLID	
Received	09/06/01	Collected/Weight	08/24/01 10:10	1562 g	
% solids	97.6	Custody/SAF No	B01-090-002	B01-090	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.027	0.049	0.082	400	U	H
Nickel 63	13981-37-8	5.26	6.3	10	30	U	NI_L
Total Strontium	SR-RAD	69.2	4.2	0.80	1.0		SR
Americium 241	14596-10-2	0.222	0.15	0.19	1.0	J	AM
Plutonium 238	13981-16-3	0	0.049	0.19	1.0	U	PU
Plutonium 239/240	PU-239/240	0.172	0.15	0.19	1.0	U	PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

1/12/02

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-04

B12P89

DATA SHEET

SDG	7075	Client/Case no	Hanford	SDG H1488	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109040-04	Client sample id	B12P89		
Dept sample id	7075-004	Location/Matrix	116-N-3 Trench-Deep Zone	SOLID	
Received	09/06/01	Collected/Weight	08/27/01 11:00	1943 g	
% solids	98.9	Custody/SAF No	B01-090-002	B01-090	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.031	0.21	0.36	400	U	H
Nickel 63	13981-37-8	53.6	7.5	10	30		NI_L
Total Strontium	SR-RAD	72.5	3.4	2.0	1.0		SR
Americium 241	14596-10-2	3.84	1.6	0.98	1.0		AM
Plutonium 238	13981-16-3	1.48	0.82	1.0	1.0		PU
Plutonium 239/240	PU-239/240	7.13	2.0	1.0	1.0		PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

1/12/02

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

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-05 B12P90

DATA SHEET

SDG	7075	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109040-05	Client sample id	B12P90
Dept sample id	7075-005	Location/Matrix	116-N-3 Trench-Deep Zone SOLID
Received	09/06/01	Collected/Weight	08/27/01 11:00 1896 g
% solids	98.9	Custody/SAF No	B01-090-002 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.109	0.20	0.34	400	U	H
Nickel 63	13981-37-8	50.0	7.4	10	30		NI_L
Total Strontium	SR-RAD	70.0	2.9	1.6	1.0		SR
Americium 241	14596-10-2	2.51	1.3	0.96	1.0		AM
Plutonium 238	13981-16-3	0.992	0.75	0.95	1.0	J	PU
Plutonium 239/240	PU-239/240	8.55	2.1	0.95	1.0		PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

1/12/02

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

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-06 B12P91

DATA SHEET

SDG	7075	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109040-06	Client sample id	B12P91
Dept sample id	7075-006	Location/Matrix	116-N-3 Trench-Deep Zone SOLID
Received	09/06/01	Collected/Weight	08/27/01 11:20 1847 g
% solids	97.2	Custody/SAF No	B01-090-002 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.129	0.19	0.31	400	U	H
Nickel 63	13981-37-8	112	8.9	10	30		NI_L
Total Strontium	SR-RAD	237	5.5	1.9	1.0		SR
Americium 241	14596-10-2	10.1	2.5	1.1	1.0		AM
Plutonium 238	13981-16-3	1.40	0.77	0.97	1.0		PU
Plutonium 239/240	PU-239/240	15.0	3.0	0.97	1.0		PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

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Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-07

B12P92

DATA SHEET

SDG	7075	Client/Case no	Hanford	SDG H1488	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109040-07	Client sample id	B12P92		
Dept sample id	7075-007	Location/Matrix	116-N-3 Trench-Deep Zone	SOLID	
Received	09/06/01	Collected/Weight	08/24/01 09:50	1458 g	
% solids	97.5	Custody/SAF No	B01-090-002	B01-090	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.032	0.052	0.086	400	U	H
Nickel 63	13981-37-8	5.35	6.3	10	30	U	NI_L
Total Strontium	SR-RAD	60.4	0.82	0.16	1.0		SR
Americium 241	14596-10-2	0.080	0.096	0.12	1.0	U	AM
Plutonium 238	13981-16-3	0	0.055	0.21	1.0	U	PU
Plutonium 239/240	PU-239/240	0.082	0.11	0.21	1.0	U	PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

1/12/02

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-08 B12P93

DATA SHEET

SDG	7075	Client/Case no	Hanford	SDG H1488	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109040-08	Client sample id	B12P93		
Dept sample id	7075-008	Location/Matrix	116-N-3 Trench-Deep Zone	SOLID	
Received	09/06/01	Collected/Weight	08/27/01 11:10	1853 g	
% solids	97.9	Custody/SAF No	B01-090-002	B01-090	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.091	0.16	0.28	400	U	H
Nickel 63	13981-37-8	279	12	10	30		NI_L
Total Strontium	SR-RAD	83.4	3.5	1.8	1.0		SR
Americium 241	14596-10-2	18.0	3.7	1.5	1.0		AM
Plutonium 238	13981-16-3	4.86	1.4	0.65	1.0		PU
Plutonium 239/240	PU-239/240	29.2	3.7	0.65	1.0		PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-09

B12P94

DATA SHEET

SDG	7075	Client/Case no	Hanford	SDG H1488	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109040-09	Client sample id	B12P94		
Dept sample id	7075-009	Location/Matrix	116-N-3 Trench-Deep Zone	SOLID	
Received	09/06/01	Collected/Weight	08/24/01 14:50	1807 g	
% solids	95.9	Custody/SAF No	B01-090-002	B01-090	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.012	0.22	0.37	400	U	H
Nickel 63	13981-37-8	43.8	7.3	10	30		NI_L
Total Strontium	SR-RAD	499	8.2	1.9	1.0		SR
Americium 241	14596-10-2	6.51	2.2	1.5	1.0		AM
Plutonium 238	13981-16-3	1.47	0.81	1.0	1.0		PU
Plutonium 239/240	PU-239/240	11.8	2.6	1.0	1.0		PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-10 B12P95

DATA SHEET

SDG	7075	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109040-10	Client sample id	B12P95
Dept sample id	7075-010	Location/Matrix	116-N-3 Trench-Deep Zone SOLID
Received	09/06/01	Collected/Weight	08/24/01 14:05 1723 g
% solids	97.9	Custody/SAF No	B01-090-002 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.022	0.050	0.086	400	U	H
Nickel 63	13981-37-8	3.06	6.2	10	30	U	NI_L
Total Strontium	SR-RAD	386	3.0	0.36	1.0		SR
Americium 241	14596-10-2	0.394	0.19	0.14	1.0	J	AM
Plutonium 238	13981-16-3	0.051	0.051	0.20	1.0	U	PU
Plutonium 239/240	PU-239/240	0.230	0.15	0.20	1.0	J	PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

RW 1/12/02

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-11

B12P96

DATA SHEET

SDG	7075	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109040-11	Client sample id	B12P96
Dept sample id	7075-011	Location/Matrix	116-N-3 Trench-Deep Zone SOLID
Received	09/06/01	Collected/Weight	08/24/01 14:40 1734 g
% solids	97.6	Custody/SAF No	B01-090-002 B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	0.069	0.055	0.089	400	U	H
Nickel 63	13981-37-8	-26.9	5.4	11	30	U	NI_L
Total Strontium	SR-RAD	-0.138	0.21	0.38	1.0	U	SR
Americium 241	14596-10-2	-0.024	0.048	0.18	1.0	U	AM
Plutonium 238	13981-16-3	0	0.047	0.18	1.0	U	PU
Plutonium 239/240	PU-239/240	0.047	0.047	0.18	1.0	U	PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

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1/12/02

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

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1488 was composed of twenty-three solid (soil) samples designated under SAF No. B01-090 with a Project Designation of: 100-NR-1 TSD Sites R.A. Verification Sampling-Soil.

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 22, 2001 and November 1,2, and 7, 2001.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

BHI requested samples B12P81 through B12P85 be analyzed for gross alpha and gross beta on October 26, 2001. No problems were encountered during the course of the analyses.

2.2 Tritium Analyses

The RPD between sample B12P87 (7075-02) and its sample duplicate was 200% greater than the 3σ limit (165%). The difference between sample B12P87 and its sample duplicate was less than 2 times the RDL (400 pCi/g) for H3. The H3 matrix spike (associated with Group 7075) percent recovery (85%) was slightly below the 3σ limits (86 to 114%), but within the laboratory protocol limits (80 to 120%). The matrix spike (associated with Group 7074) percent recovery (83%) was below the 3σ limits (86 to 114%), but within the laboratory protocol limits (80 to 120%). No other problems were encountered during the course of the analyses.

2.3 Isotopic Plutonium Analyses

Due to low yields (less 20%) Pu samples B12P74 through B12P85 (Group 7074) had to be realiquoted with new QC samples. No problems were encountered during the course of the reanalyses. No problems were encountered during the course of the analyses with samples B12P86 through B12P96 (Group 7075).

2.4 Total Strontium Analyses

BHI requested samples B12P81 through B12P85 be reanalyzed for total Sr on October 26, 2001. The results of the reanalyses matched the original data. The results of the reanalysis are reported herein. No problems were encountered during the course of either analyses.

2.5 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.6 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.7 Gamma Spectroscopy Analyses

BHI requested samples B12P81 through B12P85 be recounted on October 26, 2001. The recounted data from the samples is reported as "As" herein. No other 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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-090-001	Page 3 of 3
Collector RB Kerkow	Company Contact JD Fancher	Telephone No. 373-9123	Project Coordinator TRENT, SJ	Price Code 8L / Data Turnaround 21 Days
Project Designation 100-NR-1 TSD Sites R. A. Verification Sampling - Soil	Sampling Location 116-N-3 Trench Shallow Zone H1488 (7074)		SAF No. B01-090	Air Quality ☐
Ice Chest No. ERC99-029	Field Logbook No. EL-1524-1	COA R1325N2600	Method of Shipment PED OA	
Shipped To TMA/~~RECRA~~ RK 8/23/01	Offsite Property No. A010376		Bill of Lading/Air Bill No. 42357454-7099	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None							
Type of Container	G	G/P	~~G/P~~ P RT 8.28.01							
No. of Container(s)	1	1	1							
Volume	60mL	120mL	1000mL							
SAMPLE ANALYSIS	Mercury 7471 - (CV) TMS 8-27-01	NO2/NO3 - 353.2	See item (1) in Special Instructions.						TIE TO:	
Sample No. / Matrix * / Sample Date / Sample Time										
12P84 / SOIL / 8-24-01 / 1430			X						B12PF7	SZ-09
12P85 / SOIL / 8-24-01 / 1400			X						B12PD9	SZ-10

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	8/27/01 1625	Stored in Ref #1A TMS 8/27/01	8/27/01 1625
Removed from Ref 1A 3728	9.5.01 0400	R Thorson	9.5.01 0400
R Thorson	9.5.01 0400	FEDEX	9-5-01
Fed Ex	9-6-01 10:00	[illegible] JR Carson	9-6-01 10:00

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-154, Europium-155}; Isotopic Plutonium {Plutonium-239/240}; Americium-241; Strontium-89,90 -- Total Sr; Tritium - H3

Samples stored in Ref.#1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment. RT 9.5.01

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

HI-EE-011 (10/99)

Bechtel Hanford Inc. | **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** | **B01-090-001** | Page 2 of 3

Collector: RB Kerkow

Company Contact: JD Fancher | Telephone No.: 373-9123 | Project Coordinator: TRENT, SJ | Price Code: 8L | Data Turnaround: 21 Days

Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil

Sampling Location: 116-N-3 Trench Shallow Zone H1488 (7074) | SAF No.: B01-090 | Air Quality ☐

Ice Chest No.: ERC 99.029 | Field Logbook No.: EL-1524-1 | COA: R1325N2600 | Method of Shipment: PED

Shipped To: TMA/RECRA 8/23/01 | Offsite Property No.: A010376 | Bill of Lading/Air Bill No.: 42357954-7099

POSSIBLE SAMPLE HAZARDS/REMARKS: Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None							
Type of Container	G	G/P	P							
No. of Container(s)	1	1	1							
Volume	60mL	120mL	1000mL							
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See item (1) in Special Instructions.							

Sample No.	Matrix *	Sample Date	Sample Time									
B12P79	SOIL	8-27-01	1035			X					B12TW1	S2-07
B12P80	SOIL	8-24-01	0940			X					B12PD9	S208
B12P81	SOIL	8-24-01	1420			X					B12PF7	S2-01
B12P82	SOIL	8-24-01	1445			X					B12PF7	S2-02
B12P83	SOIL	8-24-01	1350			X					B12PD9	S2-05

TIETO:

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	8/23/01 1125	Stored in Ref #1A	8/23/01 1125
Removed from Ref 1A 3728	9.5.01 0900	R. Thorne	9.5.01 0900
R. Thorne	9.5.01 0900	FEDEX	9-5-01
FedEx	9-6-01 10:00	JR Corso	9-6-01

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90 -- Total Sr; Tritium - H3

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment.
RT 9.5.01

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	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

HHI-EE-011 (10/99)

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-090-001 | Page 1 of 3

Collector: RB Kerkow	Company Contact: JD Fancher	Telephone No.: 373-9123	Project Coordinator: TRENT, SJ
Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil	Sampling Location: 116-N-3 Trench Shallow Zone H1488 (7074)		SAF No.: B01-090
Ice Chest No.: ERC99.029	Field Logbook No.: EL-1524-1	COA: R1325N2600	Method of Shipment: PED GA
Shipped To: TMA/~~REGRA~~ RK 8/23/01	Offsite Property No.: A010376		Bill of Lading/Air Bill No.: U2357954-7090

Price Code: 8L | Data Turnaround: 21 Days | Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None								
Type of Container	G	G/P	~~G/P~~ D RT 8-28-01								
No. of Container(s)	1	1	1								
Volume	60mL	120mL	1000mL								
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See item (1) in Special Instructions.								

Sample No.	Matrix *	Sample Date	Sample Time								TIE TO:		
312P74	SOIL	8-24-01	1000			X							
312P75	SOIL	8-27-01	1015			X					B12PF7		S2-03
312P76	SOIL	8-27-01	1015			X					B12TW1		S2-04
312P77	SOIL	8-27-01	0915			X					B12TW1		S2-04
312P78	SOIL	8-27-01	1006			X					B12TW1		S2-04

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	8/27/01 1625	~~Received By~~ TMB 8/27/01 Stored in Ref #1A	8/27/01 1625
R Kemovitz	0900	R Thore	0900
Ref 1A 3728	9.5.01		9.5.01
R Thore	0900 9.5.01	FEDEX	9-5-01
Fed Ex	9-6-01 10:00	JR Corso JR Corso	9-6-01 10:00

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-154, Europium-155}; Isotopic Plutonium {Plutonium-239/240}; Americium-241; Strontium-89,90 -- Total Sr; Tritium - H3

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment. RT 9.5.01

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-090-001 | Page 3 of 3

Collector: RB Kerkow	Company Contact: JD Fancher	Telephone No.: 373-9123	Project Coordinator: TRENT, SJ
Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil	Sampling Location: 116-N-3 Trench Shallow Zone H1488 (7074)		SAF No.: B01-090
Ice Chest No.: ERC99.029	Field Logbook No.: EL-1524-1	COA: R1325N2600	Method of Shipment: RD 01
Shipped To: TMA/~~RECRA~~ RK 8/28/01	Offsite Property No.: A010376		Bill of Lading/Air Bill No.: 42357954-7099

Price Code: 8L

Data Turnaround: 21 Days

Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None							
Type of Container	G	G/P	~~G/P~~ P RT 8.28.01							
No. of Container(s)	1	1	1							
Volume	60mL	120mL	1000mL							
SAMPLE ANALYSIS	Mercury - 7471 - (CV) TMT 8-27-01	NO2/NO3 - 353.2	See item (1) in Special Instructions.						TIE TO:	

Sample No.	Matrix *	Sample Date	Sample Time									
312P84	SOIL	8-24-01	1430			X					B12PF7	SZ-09
312P85	SOIL	8-24-01	1400			X					B12PD9	SZ-10

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	8/27/01 1625	Stored in Ref #1A	8/27/01 1625
Remove Dave	9.5.01 0900	R Thorson	9.5.01 0900
Ref 1A 3728			
R Thorson	9.5.01 0900	Fed Ex	9-5-01
Fred Ex	9-6-01 10:00	J Corso, SR Corso	9-6-01 10:00

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90 -- Total Sr; Tritium - H3

Samples stored in Ref.#1A at the 3728 Shipping Facility on 8 27 01.
Collector not available to relinquish samples on 9 15 01 for shipment.
RT 9.5.01

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

HI-EE-011 (10/99)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-090-001	Page 2 of 3
Collector: RB Kerkow	Company Contact: JD Fancher; Telephone No.: 373-9123	Project Coordinator: TRENT, SJ	Price Code: 8L; Data Turnaround: 21 Days
Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil	Sampling Location: 116-N-3 Trench Shallow Zone H1488 (7074)	SAF No.: B01-090	Air Quality ☐
Ice Chest No.: ERC 99-029	Field Logbook No.: EL-1524-1; COA: R1325N2600	Method of Shipment: FED EX	
Shipped To: TMA/RECRA LE 8/23/01	Offsite Property No.: A010376	Bill of Lading/Air Bill No.: 42357954-7049	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None							
Type of Container	G	G/P	P							
No. of Container(s)	1	1	1							
Volume	60mL	120mL	1000mL							
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See item (1) in Special Instructions.							

Sample No.	Matrix *	Sample Date	Sample Time								TIETO:		
B12P79	SOIL	8-27-01	1035			X					B12TW	1	52-07
B12P80	SOIL	8-24-01	0940			X					B12PD	9	5208
B12P81	SOIL	8-24-01	1420			X					B12PF	7	52-01
B12P82	SOIL	8-24-01	1445			X					B12PF	7	52-02
B12P83	SOIL	8-24-01	1350			X					B12PD	9	52-05

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	8/23/01 1125	Stored in Ref #1A	8/23/01 1125
Removed from Ref 1A 3728	9.5.01 0900	R. Thorer	9.5.01 0900
R. Thorer	9.5.01 0900	FEDEX	9-5-01
[illegible]	9-6-01 10:00	JR Corso	9-6-01 10:00

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90 -- Total Sr; Tritium - H3

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment.
RT 9.5.01

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	B01-090-001	Page 1 of 3
Collector RB Kerkow	Company Contact JD Fancher — Telephone No. 373-9123	Project Coordinator TRENT, SJ	Price Code 8L — Data Turnaround 21 Days
Project Designation 100-NR-1 TSD Sites R. A. Verification Sampling - Soil	Sampling Location 116-N-3 Trench Shallow Zone H1488 (7074)	SAF No. B01-090	Air Quality ☐
Ice Chest No. ERC99.029	Field Logbook No. EL-1524-1 — COA R1325N2600	Method of Shipment FED EX	
Shipped To TMA/~~REGRA~~ RK 8/23/01	Offsite Property No. A010376	Bill of Lading/Air Bill No. 4235 7954-7090	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None								
Type of Container	G	G/P	~~G/P~~ P KT 8-28-01								
No. of Container(s)	1	1	1								
Volume	60mL	120mL	1000mL								
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See item (1) in Special Instructions.							TIE TO:	

Sample No.	Matrix *	Sample Date	Sample Time									
B12P74	SOIL	8-24-01	1000			X				B12PF7		S2-03
B12P75	SOIL	8-27-01	1015			X				B12TW1		S2-04
B12P76	SOIL	8-27-01	1015			X				B12TW1		S2-04
B12P77	SOIL	8-27-01	0915			X				B12TW1		S2-04
B12P78	SOIL	8-27-01	1006			X				B12TW1		S2-04

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[signature]	8/27/01 1625	[signature] TMA 8/27/01 — Stored in Ref #1A	8/27/01 1625
[signature] Remington — 1A 3728	9-5-01 0400	[signature]	9-5-01 0400
[signature] RThorn	9-5-01 0400	FEDEX	9-5-01
Fed Ex	9-6-01 1015	[signature] JRCorso	9-6-01 10:00

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90 -- Total Sr; Tritium - H3

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment.
RT 9.5.01

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

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-NR-1		116-N-3	DATA PACKAGE: H1488		
VALIDATOR: TLT		LAB: EB		DATE: 12/27/07	
CASE:			SDG: H1488		

ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			

SAMPLES/MATRIX					
B12P74	B12P75	B12P76	B12P77	B12P78	B12P79
B12P80	B12P81	B12P82	~~B12P83~~	B12P83	B12P84
B12P85	B12P86	B12P87	B12P88	B12P89	B12P90
B12P91	B12P91	B12P92	B12P93	B12P94	B12P95
					Soil

1. Completeness ..... ☒ N/A

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

Comments: _____

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

Method blank analyzed within required frequency? ..... Yes No N/A
Method blank results acceptable? ..... Yes No N/A
Analytes detected in method blank? ..... Yes No N/A
Field blank(s) analyzed? B12P77 ..... Yes No N/A
Field blank results acceptable? ..... Yes No N/A
Analytes detected in field blank(s)? ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A
Comments:

FB K-40 Ra226 Ra228 Th 228 Th 232

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

LCS /BSS analyzed within required frequency? ..... Yes No N/A
LCS/BSS recoveries acceptable? ..... Yes No N/A
LCS/BSS traceable? (Levels D,E) ..... Yes No N/A
LCS/BSS expired? (Levels D,E) ..... Yes No N/A
LCS/BSS levels correct? (Levels D,E) ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A
Comments:

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

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

Appendix A – Radiochemical Data Validation Checklist

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

Duplicates Analyzed at required frequency? ..... Yes No N/A
RPD Values Acceptable? ..... Yes No N/A
Transcription/Calculation Errors? (Levels D, E) ..... Yes No N/A
Comments:

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

Field duplicate sample(s) analyzed? ..... Yes No N/A
Field duplicate RPD values acceptable? ..... Yes No N/A
Field split sample(s) analyzed? ..... Yes No N/A
Field split RPD values acceptable? ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A
Comments: 75/76

12. Holding Times (All levels)

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

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

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

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

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

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

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

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

Comments: 74 am +DL

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109039-14

Method Blank

METHOD BLANK

SDG	7074	Client/Case no	Hanford	SDG H1488	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109039-14	Client sample id	Method Blank		
Dept sample id	7074-014	Material/Matrix		SOLID	
		SAF No	B01-090		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.303	0.18	0.32	400	U	H
Total Strontium	SR-RAD	-0.057	0.10	0.23	1.0	U	SR
Americium 241	14596-10-2	0.125	0.25	0.96	1.0	U	AM
Potassium 40	13966-00-2	U		0.036		U	GAM
Cobalt 60	10198-40-0	U		0.003	0.050	U	GAM
Cesium 137	10045-97-3	U		0.003	0.10	U	GAM
Radium 226	13982-63-3	U		0.006	0.10	U	GAM
Radium 228	15262-20-1	U		0.013	0.20	U	GAM
Europium 152	14683-23-9	U		0.007	0.10	U	GAM
Europium 154	15585-10-1	U		0.008	0.10	U	GAM
Europium 155	14391-16-3	U		0.007	0.10	U	GAM
Thorium 228	14274-82-9	U		0.006		U	GAM
Thorium 232	TH-232	U		0.013		U	GAM
Uranium 235	15117-96-1	U		0.011		U	GAM
Uranium 238	U-238	U		0.40		U	GAM
Americium 241	14596-10-2	U		0.010		U	GAM

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-BLANK 39676

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 H1488

R109039-18

Method Blank

METHOD BLANK

SDG 7074	Client/Case no Hanford	SDG H1488	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R109039-18	Client sample id Method Blank		
Dept sample id 7074-018	Material/Matrix	SOLID	
	SAF No B01-090		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	0	0	9.6	30	U	NI_L

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-BLANK 39791

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 H1488

R109039-24 **Method Blank**

METHOD BLANK

SDG	7074	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109039-24	Client sample id	Method Blank
Dept sample id	7074-024	Material/Matrix	SOLID
		SAF No	B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Plutonium 238	13981-16-3	0.184	0.18	0.71	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.18	0.71	1.0	U	PU

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-BLANK 40081

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 H1488

R109039-27

Method Blank

METHOD BLANK

SDG	7074	Client/Case no	Hanford	SDG H1488	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R109039-27	Client sample id	Method Blank		
Dept sample id	7074-027	Material/Matrix		SOLID	
		SAF No	B01-090		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.295	0.95	2.4	10	U	93A
Gross Beta	12587-47-2	-0.224	3.5	6.2	15	U	93B
Total Strontium	SR-RAD	-0.010	0.20	0.40	1.0	U	SR

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-BLANK #40124

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 H1488

R109039-13

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7074
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1488
Case no No. 630

Lab sample id R109039-13
Dept sample id 7074-013

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-090

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	22.8	0.54	0.32	400	J	H	23.8	0.95	96	84-116	80-120
Total Strontium	25.0	0.57	0.19	1.0		SR	21.9	0.88	114	81-119	80-120
Americium 241	94.1	9.1	0.92	1.0		AM	95.5	3.8	99	83-117	80-120
Cobalt 60	0.247	0.018	0.012	0.050		GAM	0.266	0.011	93	76-124	80-120
Cesium 137	0.310	0.016	0.013	0.10		GAM	0.304	0.012	102	75-125	80-120

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-LCS 39675

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 H1488

R109039-17

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7074
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1488
Case no No. 630

Lab sample id R109039-17
Dept sample id 7074-017

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-090

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
Nickel 63	1300	22	9.3	30		NI_L	1320	53	98	84-116	80-120

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-LCS 39790

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 H1488

R109039-23

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7074
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1488
Case no No. 630

Lab sample id R109039-23
Dept sample id 7074-023

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-090

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
Plutonium 238	120	9.6	0.67	1.0		PU	123	4.9	98	85-115	80-120
Plutonium 239/240	130	10	0.67	1.0		PU	132	5.3	98	85-115	80-120

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-LCS 40080

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 H1488

R109039-26

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7074
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1488
Case no No. 630

Lab sample id R109039-26
Dept sample id 7074-026

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-090

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
Gross Alpha	189	14	3.4	10		93A	200	8.0	94	69-131	70-130
Gross Beta	207	11	9.2	15		93B	218	8.7	95	77-123	70-130
Total Strontium	22.7	0.84	0.25	1.0		SR	21.8	0.87	104	82-118	80-120

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-LCS #40123

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 H1488

R109039-15

B12P74

DUPLICATE

SDG 7074		Client/Case no Hanford	SDG H1488
Contact Melissa C. Mannion		Case no No. 630	
DUPLICATE	ORIGINAL		
Lab sample id R109039-15	Lab sample id R109039-01	Client sample id B12P74	
Dept sample id 7074-015	Dept sample id 7074-001	Location/Matrix 116-N-3 Trench-Shallow	SOLID
	Received 09/06/01	Collected/Weight 08/24/01 10:00	1530 g
% solids 97.5	% solids 97.5	Custody/SAF No B01-090-001	B01-090

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
Tritium	0.024	0.064	0.11	400	U	H	-0.014	0.060	0.10	U	-	
Total Strontium	-0.085	0.16	0.20	1.0	U	SR	-0.071	0.13	0.17	U	-	
Americium 241	0.214	0.85	2.0	1.0	U	AM	0.387	1.0	1.7	U	-	
Potassium 40	9.33	0.21	0.087			GAM	8.77	0.24	0.086		6	32
Cobalt 60	U		0.010	0.050	U	GAM	U		0.012	U	-	
Cesium 137	U		0.009	0.10	U	GAM	U		0.011	U	-	
Radium 226	0.360	0.018	0.017	0.10		GAM	0.349	0.022	0.020		3	34
Radium 228	0.484	0.039	0.040	0.20		GAM	0.501	0.050	0.046		3	37
Europium 152	U		0.021	0.10	U	GAM	U		0.025	U	-	
Europium 154	U		0.032	0.10	U	GAM	U		0.036	U	-	
Europium 155	U		0.031	0.10	U	GAM	U		0.047	U	-	
Thorium 228	0.450	0.012	0.011			GAM	0.548	0.024	0.022		20	33
Thorium 232	0.484	0.039	0.040			GAM	0.501	0.050	0.046		3	37
Uranium 235	U		0.038		U	GAM	U		0.045	U	-	
Uranium 238	U		1.2		U	GAM	U		1.4	U	-	
Americium 241	U		0.075		U	GAM	U		0.034	U	-	

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-DUP#1 39677

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 H1488

R109039-19 B12P74

DUPLICATE

SDG	7074			Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion			Case no	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R109039-19	Lab sample id	R109039-01	Client sample id	B12P74
Dept sample id	7074-019	Dept sample id	7074-001	Location/Matrix	116-N-3 Trench-Shallow SOLID
		Received	09/06/01	Collected/Weight	08/24/01 10:00 1530 g
		% solids	97.5	Custody/SAF No	B01-090-001 B01-090

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
Nickel 63	-3.06	5.6	9.7	30	U	NI_L	-1.67	6.8	12	U	-		

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-DUP#1 39792

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

000032

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109039-25

B12P74

DUPLICATE

SDG	7074			Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R109039-25	Lab sample id	R109039-01	Client sample id	B12P74
Dept sample id	7074-025	Dept sample id	7074-001	Location/Matrix	116-N-3 Trench-Shallow SOLID
		Received	09/06/01	Collected/Weight	08/24/01 10:00 1530 g
% solids	97.5	% solids	97.5	Custody/SAF No	B01-090-001 B01-090

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
Plutonium 238	0	0.22	0.85	1.0	U	PU	0	0.23	0.87	U	-	
Plutonium 239/240	0	0.22	0.85	1.0	U	PU	-0.114	0.23	0.87	U	-	

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-DUP#1A1 40082

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 H1488

R109039-28 B12P82

DUPLICATE

SDG	7074			Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R109039-28	Lab sample id	R109039-09	Client sample id	B12P82
Dept sample id	7074-028	Dept sample id	7074-009	Location/Matrix	116-N-3 Trench-Shallow SOLID
		Received	09/06/01	Collected/Weight	08/24/01 14:45 1857 g
% solids	99.2	% solids	99.2	Custody/SAF No	B01-090-001 B01-090

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
Gross Alpha	6.16	4.1	4.3	10	J	93A	2.64	3.4	4.1	U	80	187	
Gross Beta	95.6	8.5	9.2	15		93B	94.8	7.5	6.4		1	36	

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-DUP#9 40125

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 H1488

R109039-29

B12P82

DUPLICATE

SDG	7074			Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion			Case no	No. 630
DUPLICATE		ORIGINAL			
Lab sample id	R109039-29	Lab sample id	R109039-09	Client sample id	B12P82
Dept sample id	7074-029	Dept sample id	7074-009	Location/Matrix	116-N-3 Trench-Shallow SOLID
		Received	09/06/01	Collected/Weight	08/24/01 14:45 1857 g
% solids	99.2	% solids	99.2	Custody/SAF No	B01-090-001 B01-090

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
Total Strontium	49.2	2.8	1.2	1.0		SR	47.3	2.7	1.2		4	24	

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-DUP#9A1 40126

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 H1488

R109039-16

B12P74

MATRIX SPIKE

SDG	7074			Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion			Case no	No. 630
	MATRIX SPIKE		ORIGINAL		
Lab sample id	R109039-16	Lab sample id	R109039-01	Client sample id	B12P74
Dept sample id	7074-016	Dept sample id	7074-001	Location/Matrix	116-N-3 Trench-Shallow SOLID
		Received	09/06/01	Collected/Weight	08/24/01 10:00 1530 g
% solids	97.5	% solids	97.5	Custody/SAF No	B01-090-001 B01-090

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	39.9	0.41	0.11	400	JX	H	48.0	1.9	-0.014	0.060	83	86-114	60-140

100-NR-1 TSD Sites RA Ver Smpg-Soil

QC-MS#1 39678

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-15

B12P87

MATRIX SPIKE

SDG	7075			Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion			Case no	No. 630
	MATRIX SPIKE		ORIGINAL		
Lab sample id	R109040-15	Lab sample id	R109040-02	Client sample id	B12P87
Dept sample id	7075-015	Dept sample id	7075-002	Location/Matrix	116-N-3 Trench-Deep Zone SOLID
		Received	09/06/01	Collected/Weight	08/27/01 10:45 1907 g
% solids	98.8	% solids	98.8	Custody/SAF No	B01-090-002 B01-090

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	160	1.6	0.37	400	JX	H	188	7.5	-0.026	0.20	85	86-114	60-140

100-NR-1 TSD Sites RA Ver. Smpg-Soil

QC-MS#2 39685

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-18

B12P87

DUPLICATE

SDG	7075			Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion			Case no	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R109040-18	Lab sample id	R109040-02	Client sample id	B12P87
Dept sample id	7075-018	Dept sample id	7075-002	Location/Matrix	116-N-3 Trench-Deep Zone SOLID
		Received	09/06/01	Collected/Weight	08/27/01 10:45 1907 g
% solids	98.8	% solids	98.8	Custody/SAF No	B01-090-002 B01-090

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
Nickel 63	232	11	10	30		NI_L	227	11	10		2	24	

100-NR-1 TSD Sites RA Ver. Smpg-Soil

QC-DUP#2 39795

DUPLICATES
Page 2
SUMMARY DATA SECTION
Page 14

000083

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-14

B12P87

DUPLICATE

SDG	7075	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Case no	No. 630
DUPLICATE		ORIGINAL	
Lab sample id	R109040-14	Lab sample id	R109040-02
Dept sample id	7075-014	Dept sample id	7075-002
		Received	09/06/01
% solids	98.8	% solids	98.8
Client sample id	B12P87		
Location/Matrix	116-N-3 Trench-Deep Zone SOLID		
Collected/Weight	08/27/01 10:45 1907 g		
Custody/SAF No	B01-090-002 B01-090		

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ TOT	PROT LIMIT
Tritium	0.536	0.23	0.36	400	J	H	-0.026	0.20	0.35	U	200	165	
Total Strontium	279	8.3	2.0	1.0		SR	292	6.0	1.7		5	22	
Americium 241	16.7	3.6	1.2	1.0		AM	21.2	3.6	0.96		24	42	
Plutonium 238	3.54	1.2	0.63	1.0		PU	4.21	1.5	1.1		17	75	
Plutonium 239/240	22.3	2.9	0.63	1.0		PU	26.1	4.3	1.1		16	34	

100-NR-1 TSD Sites RA Ver. Smpg-Soil

QC-DUP#2 39684

000029

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

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1488

R109040-16

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7075
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1488
Case no No. 630

Lab sample id R109040-16
Dept sample id 7075-016

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-090

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
Nickel 63	1150	21	10	30		NI_L	1160	46	99	84-116	80-120

100-NR-1 TSD Sites RA Ver. Smpg-Soil

QC-LCS 39793

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

000070

R109040-12

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7075
Contact Melissa C. Mannion

Client/Case no Hanford SDG H1488
Case no No. 630

Lab sample id R109040-12
Dept sample id 7075-012

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B01-090

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	97.2	2.3	1.2	400	J	H	95.6	3.8	102	83-117	80-120
Total Strontium	239	8.0	2.0	1.0		SR	230	9.2	104	82-118	80-120
Americium 241	108	10	0.96	1.0		AM	105	4.2	103	83-117	80-120
Plutonium 238	138	13	0.90	1.0		PU	136	5.4	102	83-117	80-120
Plutonium 239/240	142	13	0.90	1.0		PU	145	5.8	98	84-116	80-120

100-NR-1 TSD Sites RA Ver. Smpg-Soil

QC-LCS 39682

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

METHOD BLANK

SDG	7075	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109040-17	Client sample id	Method Blank
Dept sample id	7075-017	Material/Matrix	SOLID
		SAF No	B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Nickel 63	13981-37-8	2.89	6.0	10	30	U	NI_L

100-NR-1 TSD Sites RA Ver. Smpg-Soil

QC-BLANK 39794

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

METHOD BLANK

SDG	7075	Client/Case no	Hanford SDG H1488
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R109040-13	Client sample id	Method Blank
Dept sample id	7075-013	Material/Matrix	SOLID
		SAF No	B01-090

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.442	0.60	1.1	400	U	H
Total Strontium	SR-RAD	-0.283	0.86	1.9	1.0	U	SR
Americium 241	14596-10-2	0.121	0.24	0.92	1.0	U	AM
Plutonium 238	13981-16-3	0	0.24	0.93	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.24	0.93	1.0	U	PU

100-NR-1 TSD Sites RA Ver. Smpg-Soil

QC-BLANK 39683

Date: 12 January 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-NR-1 TSD Sites R.A. Verification Sampling - Soil - Waste Site 116-N-3
Subject: Inorganics - Data Package No. H1488-LLI (SDG No. H1488)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1488-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
B12P74	8/24/01	Soil	C	Mercury by 7471A
B12P75	8/27/01	Soil	C	Mercury by 7471A
B12P76	8/27/01	Soil	C	Mercury by 7471A
B12P77	8/27/01	Soil	C	Mercury by 7471A
B12P78	8/27/01	Soil	C	Mercury by 7471A
B12P79	8/27/01	Soil	C	Mercury by 7471A
B12P80	8/24/01	Soil	C	Mercury by 7471A
B12P81	8/24/01	Soil	C	Mercury by 7471A
B12P82	8/24/01	Soil	C	Mercury by 7471A
B12P83	8/24/01	Soil	C	Mercury by 7471A
B12P84	8/24/01	Soil	C	Mercury by 7471A
B12P85	8/24/01	Soil	C	Mercury by 7471A
B12P86	8/24/01	Soil	C	Mercury by 7471A
B12P87	8/27/01	Soil	C	Mercury by 7471A
B12P88	8/24/01	Soil	C	Mercury by 7471A
B12P89	8/27/01	Soil	C	Mercury by 7471A
B12P90	8/27/01	Soil	C	Mercury by 7471A
B12P91	8/27/01	Soil	C	Mercury by 7471A
B12P92	8/24/01	Soil	C	Mercury by 7471A
B12P93	8/27/01	Soil	C	Mercury by 7471A
B12P94	8/24/01	Soil	C	Mercury by 7471A
B12P95	8/24/01	Soil	C	Mercury by 7471A
B12P96	8/24/01	Soil	C	Mercury by 7471A

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 28 days for mercury.

  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 Blank

One field blank was submitted for analysis (B12P77). All field 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.

All 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 was submitted for analysis (B12P75/B12P76). The duplicate sample results were compared using the validation guidelines for

determining the RPD between a sample and its duplicate. 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 detection limits met the analyte specific TDL.

- **Completeness**

  Data package No. H1488-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

None found.

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: H1488	REVIEWER: TLI	DATE: 1/12/02	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																					
Laboratory: LLI																					
Case	SDG: H1488																				
Sample Number		B12P74		B12P75		B12P76		B12P77		B12P78		B12P79		B12P80		B12P81		B12P82		B12P83	
Location																					
Sample Date		8/24/01		8/27/01		8/27/01		8/27/01		8/27/01		8/27/01		8/24/01		8/24/01		8/24/01		8/24/01	
Inorganics	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Mercury	0.05	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.01	U	0.01	U
Sample Number		B12P84		B12P85		B12P86		B12P87		B12P88		B12P89		B12P90		B12P91		B12P92		B12P93	
Remarks																					
Sample Date		8/24/01		8/24/01		8/24/01		8/27/01		8/24/01		8/27/01		8/27/01		8/27/01		8/24/01		8/27/01	
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Mercury	0.05	0.01	U	0.02	U	0.02	U	0.01	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U
Sample Number		B12P94		B12P95		B12P96															
Remarks																					
Sample Date		8/24/01		8/24/01		8/24/01															
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Mercury	0.05	0.02	U	0.02	U	0.02	U														

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 09/20/01

CLIENT: TNU-HANFORD B01-090 H1488

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

LVL LOT #: 0109L767

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12P74	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-002	B12P75	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-003	B12P76	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-004	B12P77	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-005	B12P78	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-006	B12P79	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-007	B12P80	Mercury, Total	0.01 u	MG/KG	0.01	1.0
-008	B12P81	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-009	B12P82	Mercury, Total	0.01 u	MG/KG	0.01	1.0
-010	B12P83	Mercury, Total	0.01 u	MG/KG	0.01	1.0
-011	B12P84	Mercury, Total	0.01 u	MG/KG	0.01	1.0
-012	B12P85	Mercury, Total	0.02 u	MG/KG	0.02	1.0

1/12/02

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/20/01

CLIENT: TNU-HANFORD B01-090 H1488

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

LVL LOT #: 0109L764

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12P86	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-002	B12P87	Mercury, Total	0.01 u	MG/KG	0.01	1.0
-003	B12P88	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-004	B12P89	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-005	B12P90	Mercury, Total	0.01 u	MG/KG	0.01	1.0
-006	B12P91	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-007	B12P92	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-008	B12P93	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-009	B12P94	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-010	B12P95	Mercury, Total	0.02 u	MG/KG	0.02	1.0
-011	B12P96	Mercury, Total	0.02 u	MG/KG	0.02	1.0

1/12/02

8

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-090
LVL#: 0109L764, 767
SDG/SAF#: H1488/B01-090

W.O.#: 11343-606-001-9999-00
Date Received: 09-06-01

METALS CASE NARRATIVE

1. This narrative covers the analyses of 23 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. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.

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.

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 29 pages.

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

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

09-25-01
Date

gmb/m09-764, 767

LVLI
LIONVILLE LABORATORY INC

OCT 2001
RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B01-090

H1488

DATE RECEIVED: 09/06/01 LVL LOT # :0109L764

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12P86						
MERCURY, TOTAL	001	S	01C0285	08/24/01	09/17/01	09/18/01
MERCURY, TOTAL	001 REP	S	01C0285	08/24/01	09/17/01	09/18/01
MERCURY, TOTAL	001 MS	S	01C0285	08/24/01	09/17/01	09/18/01
B12P87						
MERCURY, TOTAL	002	S	01C0285	08/27/01	09/17/01	09/18/01
B12P88						
MERCURY, TOTAL	003	S	01C0285	08/24/01	09/17/01	09/18/01
B12P89						
MERCURY, TOTAL	004	S	01C0285	08/27/01	09/17/01	09/18/01
B12P90						
MERCURY, TOTAL	005	S	01C0285	08/27/01	09/17/01	09/18/01
B12P91						
MERCURY, TOTAL	006	S	01C0285	08/27/01	09/17/01	09/18/01
B12P92						
MERCURY, TOTAL	007	S	01C0285	08/24/01	09/17/01	09/18/01
B12P93						
MERCURY, TOTAL	008	S	01C0285	08/27/01	09/17/01	09/18/01
B12P94						
MERCURY, TOTAL	009	S	01C0285	08/24/01	09/17/01	09/18/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B01-090

H1488

DATE RECEIVED: 09/06/01 LVL LOT # :0109L764

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12P95						
MERCURY, TOTAL	010	S	01C0285	08/24/01	09/17/01	09/18/01
B12P96						
MERCURY, TOTAL	011	S	01C0285	08/24/01	09/17/01	09/18/01

LAB QC:

MERCURY LABORATORY	LC1 BS	S	01C0285	N/A	09/17/01	09/18/01
MERCURY, TOTAL	MB1	S	01C0285	N/A	09/17/01	09/18/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B01-090

H1488

DATE RECEIVED: 09/06/01 LVL LOT # :0109L767

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12P74						
MERCURY, TOTAL	001	S	01C0284	08/24/01	09/17/01	09/18/01
MERCURY, TOTAL	001 REP	S	01C0284	08/24/01	09/17/01	09/18/01
MERCURY, TOTAL	001 MS	S	01C0284	08/24/01	09/17/01	09/18/01
B12P75						
MERCURY, TOTAL	002	S	01C0284	08/27/01	09/17/01	09/18/01
B12P76						
MERCURY, TOTAL	003	S	01C0284	08/27/01	09/17/01	09/18/01
B12P77						
MERCURY, TOTAL	004	S	01C0284	08/27/01	09/17/01	09/18/01
B12P78						
MERCURY, TOTAL	005	S	01C0284	08/27/01	09/17/01	09/18/01
B12P79						
MERCURY, TOTAL	006	S	01C0284	08/27/01	09/17/01	09/18/01
B12P80						
MERCURY, TOTAL	007	S	01C0284	08/24/01	09/17/01	09/18/01
B12P81						
MERCURY, TOTAL	008	S	01C0284	08/24/01	09/17/01	09/18/01
B12P82						
MERCURY, TOTAL	009	S	01C0284	08/24/01	09/17/01	09/18/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B01-090 H1488

DATE RECEIVED: 09/06/01 LVL LOT # :0109L767

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12P83						
MERCURY, TOTAL	010	S	01C0284	08/24/01	09/17/01	09/18/01
B12P84						
MERCURY, TOTAL	011	S	01C0284	08/24/01	09/17/01	09/18/01
B12P85						
MERCURY, TOTAL	012	S	01C0284	08/24/01	09/17/01	09/18/01

LAB QC:

MERCURY LABORATORY	LC1 BS	S	01C0284	N/A	09/17/01	09/18/01
MERCURY, TOTAL	MB1	S	01C0284	N/A	09/17/01	09/18/01

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-090-002	Page 3 of 3
lector B Kerkow	Company Contact JD Fancher	Telephone No. 373-9123	Project Coordinator TRENT, SJ	Price Code 8L / Data Turnaround 21 Days
ject Designation 00-NR-1 TSD Sites R. A. Verification Sampling - Soil	Sampling Location 116-N-3 Trench - Deep Zone		SAF No. B01-090	Air Quality ☐
Chest No. ERC 01-027	Field Logbook No. EL-1524-1	COA R1325N2600	Method of Shipment FED EX	
ipped To PMA/RECRA	Offsite Property No. RSR # 106927		Bill of Lading/Air Bill No. NA	

OSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

pecial Handling and/or Storage

Preservation	None	Cool 4C	None								
Type of Container	G	G/P	G/P								
No. of Container(s)	1	1	1								
Volume	60mL	120mL	100mL								
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See Item (1) in Special Instructions.						TIE TO:		
Sample No.	Matrix *	Sample Date	Sample Time								
12P96	SOIL	8-24-01	1440	X	X					B12TW4	D2-10

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[signature]	8/31/01 1010	[signature]	8/31/01 1010
Removed from Ref 1A 3728	9.5.01 0800	[signature] RThore	9-5.01 0800
[signature] RThore	9.5.01 0800	FED Ex	
FED Ex	9.6.01 / 09:05	[signature]	9.6.01 / 09:05

SPECIAL INSTRUCTIONS

(1) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90 -- Total Sr; Tritium - H3~~ MJ 8-27-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment.

RT 9.5.01

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	B01-090-002	Page 2 of 2
Collector: RB Kerkow	Company Contact: JD Fancher; Telephone No.: 373-9123	Project Coordinator: TRENT, SJ	Price Code: 8L; Data Turnaround: 21 Days
Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil	Sampling Location: 116-N-3 Trench - Deep Zone	SAF No.: B01-090	Air Quality ☐
Ice Chest No.: ERC 01-027	Field Logbook No.: EL-1524-1; COA: R1325N2600	Method of Shipment: FED EX	
Shipped To: ~~TMA~~/RECRA 8/23/01	Offsite Property No.: BSR# 106927	Bill of Lading/Air Bill No.: N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None								
Type of Container	G	G/P	G/P								
No. of Container(s)	1	1	1								
Volume	60mL	120mL	1000mL								
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See item (1) in Special Instructions.								
Sample No.	Matrix *	Sample Date	Sample Time							TIE TO:	
B12P91	SOIL	8-27-01	1120	X	X					B12TW6	D2-06
B12P92	SOIL	8-24-01	0900	X	X					B12TW4	D2-08
B12P93	SOIL	8-27-01	1110	X	X					B12TW6	D2-09
B12P94	SOIL	8-24-01	1450	X	X					B12TW6	D2-05
B12P95	SOIL	8-24-01	1405	X	X					B12TW4	D2-07

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	8/23/01 1110	Stored in IA #IA 106927	
Relinquished By: Removed from IA 3728	9.5.01 0800	Received By: R. Thore	9.5.01 0800
Relinquished By: R. Thore	9.5.01 0800	Received By: FEDEX	
Relinquished By: FED EX	9-6-01 09:05	Received By: [illegible]	9-6-01 09:05
Relinquished By		Received By	
Relinquished By		Received By	

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90 — Total Sr, Tritium - H3~~ TMT 8-27-01

Samples stored in Ref.# IA at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment.

RT 9.5.01

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B01-090-002	Page 1 of 2
Collector RB Kerkow	Company Contact JD Fancher	Telephone No. 373-9123	Project Coordinator TRENT, SJ	Price Code 8L / Data Turnaround 21 Days
Project Designation 100-NR-1 TSD Sites R. A. Verification Sampling - Soil	Sampling Location 116-N-3 Trench - Deep Zone		SAF No. B01-090	Air Quality ☐
Ice Chest No. ERC-01-027	Field Logbook No. EL-1524-1	COA R1325N2600	Method of Shipment FED EX	
Shipped To ~~EMA~~/RECRA	Offsite Property No. RSR# 106927		Bill of Lading/Air Bill No. WA.	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None
Type of Container	G	G/P	G/P
No. of Container(s)	1	1	1
Volume	60mL	120mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See item (1) in Special Instructions.	TIE TO:	
~~B12P86~~	SOIL	8-24-01	0930	X	X		B12TW 4	D2-01
B12P87	SOIL	8-27-01	1045	X	X		B12TW 6	D2-02
~~B12P88~~	~~SOIL~~	8-24-01	1010	X	X		~~B12TW 4~~	D2-03
~~B12P89~~	SOIL	8-27-01	1100	X	X		~~B12TW 4~~	D2-04
~~B12P90~~	SOIL	8-27-01	1100	X	X		~~B12TW 4~~	D2-04

CHAIN OF POSSESSION

Relinquished By (Sign/Print Name)	Date/Time	Received By (Sign/Print Name)	Date/Time
[illegible]	8/27/01 1610	[illegible] REF #1A	8/27/01 1610
Removed from Ref 1A 3728	9.5.01 0800	R. R Thorson	9.5.01 0800
R. R Thorson	9.5.01 0800	FED EX	
FED EX	9.6.01 0905	[illegible]	9.6.01 0905

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90 - Total Sr, Tritium - H3~~ MM 8-27-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment.

RT 9.5.01

Matrix *

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

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

PUR-EF-044 (10/00)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-090-002	Page 1 of 3
llector RB Kerkow	Company Contact JD Fancher / Telephone No. 373-9123	Project Coordinator TRENT, SJ	Price Code 8L / Data Turnaround 21 Days
oject Designation 100-NR-1 TSD Sites R. A. Verification Sampling - Soil	Sampling Location 116-N-3 Trench - Deep Zone	SAF No. B01-090	Air Quality ☐
Chest No. ERC-01-027	Field Logbook No. EL-1524-1 / COA R1325N2600	Method of Shipment FED EX	
ipped To PMA/RECRA	Offsite Property No. RSR# 106927	Bill of Lading/Air Bill No. WA	

OSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

pecial Handling and/or Storage

Preservation	None	Cool 4C	None							
Type of Container	G	G/P	G/P							
No. of Container(s)	1	1	1							
Volume	60mL	120mL	1000mL							
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See Item (1) in Special Instructions.						TIE TO:	

Sample No.	Matrix *	Sample Date	Sample Time									
12P86	SOIL	8-24-01	0930	x	x						B12TW 4	D2-01
~~12P87~~	~~SOIL~~	~~8-27-01~~	~~1045~~	~~x~~	~~x~~						~~B12TW 6~~	~~D2-02~~
12P88	SOIL	8-24-01	1010	x	x						B12TW 4	D2-03
12P89	SOIL	8-27-01	1100	x	x						B12TW 4	D2-04
12P90	SOIL	8-27-01	1100	x	x						B12TW 4	D2-04

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[signature]	8/27/01 1610	[signature] MOAB INTEF #1A	8/27/01 1610
[signature] R Moore/Trent	0800 9.5.01	[signature] R Thore	0800 9.5.01
[signature] R Thore	0800 9.5.01	FED EX	
FED EX	9.6.01 09:05	D. Johnson	9.6.01 09:05

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90 — Total Sr, Tritium - H3~~ TMT 8-27-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment.

RT 9.5.01

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

HI-EE-011 (10/99)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-090-001

Bechtel Hanford Inc.

Collector: RB Kerkow

Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil

Ice Chest No.: SM1-549

Shipped To: TMA/RECRA

Company Contact: JD Fancher

Telephone No.: 373-9123

Sampling Location: 116-N-3 Trench Shallow Zone

Field Logbook No.: EL-1524-1

COA: R1325N2600

Offsite Property No.: A010366

Project Coordinator: TRENT, SJ

SAF No.: B01-090

Price Code: 8L

Air Quality ☐

Data Turnaround: 21 Days

Method of Shipment: FED EX

Bill of Lading/Air Bill No.: 4235 7954 7878

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None
Type of Container	G	G/P	G/P
No. of Container(s)	1	1	
Volume	60mL	120mL	1000mL
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See Item (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time				TIE TO:	
B12P84	SOIL	8-24-01	1430	X	X		B12PF7	S2-09
B12P85	SOIL	8-24-01	1400	X	X		B12PD9	S2-10

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	8/27/01 1410	[illegible] Ref IA	8/27/01 1410
R Thoren	9.5.01 0900	R Thoren	9.5.01 0900
R Thoren	9.5.01 0900	FED EX	
FED EX	9-6-01 1455	[illegible]	9-6-01 1455

Sign/Print Names

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90 — Total Sr; Tritium - H3~~ [illegible] 8-27-01

Samples stored in Ref.# IA at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9.5.01 for shipment. RT 9.5.01

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		

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B01-090-001	Page 2 of 3

Collector: RB Kerkow	Company Contact: JD Fancher; Telephone No.: 373-9123	Project Coordinator: TRENT, SJ	Price Code: 8L; Data Turnaround: 21 Days
Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil	Sampling Location: 116-N-3 Trench Shallow Zone	SAF No.: B01-090	Air Quality ☐
Ice Chest No.: Sm1-599	Field Logbook No.: EL-1524-1; COA: R1325N2600	Method of Shipment: FED EX	
Shipped To: ~~TMA~~/RECRA	Offsite Property No.: A010366	Bill of Lading/Air Bill No.: 4235795 4-7078	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None								
Type of Container	G	G/P	G/P								
No. of Container(s)	1	1	1								
Volume	60mL	120mL	1000mL								
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See item (1) in Special Instructions.						TIE TO:		
Sample No. / Matrix * / Sample Date / Sample Time											
B12P79 / SOIL / 8-27-01 / 1035	X	X							B12TW	1	S2-07
B12P80 / SOIL / 8-24-01 / 0940	X	X							B12PD	9	S2-08
B12P81 / SOIL / 8-24-01 / 1420	X	X							B12PF	7	S2-01
B12P82 / SOIL / 8-24-01 / 1445	X	X							B12PF	7	S2-02
B12P83 / SOIL / 8-24-01 / 1350	X	X							B12PD	9	S2-05

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[signature]	8/27/01 1610	[signature]	8/27/01 1610
Removed from Ref #1A 3728	9.5.01 0900	[signature]	9.5.01 0900
[signature]	9.5.01 0900	FED EX	
FED EX	9-6-01 1455	[signature]	9-6-01 1455

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90 – Total Sr; Tritium – H3 MJJ 8-27-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment. RT 9.5.01

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)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.

Collector: RB Kerkow

Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil

Ice Chest No.: SM1-599

Shipped To: ~~EMA~~/RECRA

Company Contact: JD Fancher — Telephone No.: 373-9123

Sampling Location: 116-N-3 Trench Shallow Zone

Field Logbook No.: EL-1524-1 — COA: R1325N2600

Offsite Property No.: A010366

Project Coordinator: TRENT, SJ

SAF No.: B01-090

Price Code: 8L

Data Turnaround: 21 Days

Air Quality ☐

Method of Shipment: FED EX

Bill of Lading/Air Bill No.: 4235745 4 - 7078

POSSIBLE SAMPLE HAZARDS/REMARKS: Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None
Type of Container	G	~~OT~~ G ET	G/P
No. of Container(s)	1	1	1
Volume	60mL	120mL	1000mL
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	Sel-Hg (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time									TIETO:	
B12P74	SOIL	8-24-01	1000	X	X							B12PF7	S2-03
B12P75	SOIL	8-27-01	1015	X	X							B12TW1	S2-04
B12P76	SOIL	8-27-01	1015	X	X							B12TW1	S2-04
B12P77	SOIL	8-27-01	0915	X	X							B12TW1	S2-04
B12P78	SOIL	8-27-01	1006	X	X							B12TW1	S2-06

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
[signature]	8/27/01 1610	Stored in Ref # 1A	8/27/01 1610
Removed from Ref 1A 3728	9.5.01 0900	R. R Thoren	9.5.01 0900
R R Thoren	9.5.01 0900	FED EX	
FED EX	9-6-01 1455	[signature]	9-6-01 1455

SPECIAL INSTRUCTIONS

~~(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240), Americium-241, Strontium-89,90 -- Total Sr, Tritium - HP~~ TMJ 8-27-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment. RT 9.5.01

Relinquished By	Date/Time	Received By	Date/Time
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	

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100NR1 116-N-3			DATA PACKAGE: H1488		
VALIDATOR: TCI		LAB: LTC		DATE: 12/28/01	
CASE:			SDG: H1488		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
B12P74	B12P75	B12P76	B12P77	B12P78	B12P79	B12P80	B12P81
B12P82	B12P83	B12P84	B12P85	B12P86	B12P87	B12P88	B12P89
B12P90	B12P91	B12P92	B12P93	B12P94	B12P95	B12P96	
						Soil	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

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

ICP interference checks acceptable? ..... Yes No N/A

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A

ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A

Laboratory blanks analyzed? ..... Yes No N/A

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

Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A

Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A

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

Comments:

4. ACCURACY (Levels C, D, and E)

MS/MSD samples analyzed? ..... Yes No N/A

MS/MSD results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

LCS/BSS samples analyzed? ..... Yes No N/A

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

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

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

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

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

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

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

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

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

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

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

ICP serial dilution samples analyzed? ..... Yes No N/A

ICP serial dilution %D values acceptable? ..... Yes No N/A

ICP post digestion spike required? ..... Yes No N/A

ICP post digestion spike values acceptable? ..... Yes No N/A

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

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

Transcription/calculation errors? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

7. FURNACE AA QUALITY CONTROL (Levels D and E)

Duplicate injections performed as required? ..... Yes No N/A

Duplicate injection %RSD values acceptable? ..... Yes No N/A

Analytical spikes performed as required? ..... Yes No N/A

Analytical spike recoveries acceptable? ..... Yes No N/A

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

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

MSA performed as required? ..... Yes No N/A

MSA results acceptable? ..... Yes No N/A

Transcription/calculation errors? ..... Yes No N/A

Comments: _____

8. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

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

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

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

Comments:

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/20/01

CLIENT: TNU-HANFORD B01-090

LVL LOT #: 0109L767

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B12P74	Mercury, Total	0.02u	0.01u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/20/01

CLIENT: TNU-HANFORD B01-090

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

LVL LOT #: 0109L764

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B12P86	Mercury, Total	0.02u	0.02u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/20/01

CLIENT: TNU-HANFORD B01-090

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

LVL LOT #: 0109L767

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B12P74	Mercury, Total	0.16	0.02u	0.16	98.8	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/20/01

CLIENT: TNU-HANFORD B01-090

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

LVL LOT #: 0109L764

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B12P86	Mercury, Total	0.15	0.02u	0.15	96.8	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/20/01

CLIENT: TNU-HANFORD B01-090

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

LVL LOT #: 0109L764

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01C0285-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/20/01

CLIENT: TNU-HANFORD B01-090

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

LVL LOT #: 0109L767

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01C0284-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Date: 12 January 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-NR-1 TSD Sites R.A. Verification Sampling - Soil - Waste Site 116-N-3
Subject: Wet Chemistry - Data Package No. H1488-LLI (SDG No. H1488)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1488-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
B12P74	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P75	8/27/01	Soil	C	Nitrate/nitrite by 353.2.
B12P76	8/27/01	Soil	C	Nitrate/nitrite by 353.2.
B12P77	8/27/01	Soil	C	Nitrate/nitrite by 353.2.
B12P78	8/27/01	Soil	C	Nitrate/nitrite by 353.2.
B12P79	8/27/01	Soil	C	Nitrate/nitrite by 353.2.
B12P80	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P81	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P82	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P83	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P84	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P85	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P86	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P87	8/27/01	Soil	C	Nitrate/nitrite by 353.2.
B12P88	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P89	8/27/01	Soil	C	Nitrate/nitrite by 353.2.
B12P90	8/27/01	Soil	C	Nitrate/nitrite by 353.2.
B12P91	8/27/01	Soil	C	Nitrate/nitrite by 353.2.
B12P92	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P93	8/27/01	Soil	C	Nitrate/nitrite by 353.2.
B12P94	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P95	8/24/01	Soil	C	Nitrate/nitrite by 353.2.
B12P96	8/24/01	Soil	C	Nitrate/nitrite by 353.2.

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 all analytes are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Twenty-eight days for nitrate/nitrite.

Due to holding times being missed (30 & 33 days), all nitrate/nitrite results were qualified as estimates and flagged "J".

- **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 Blank

One field blank (B12P77) was submitted for analysis. All field 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.

All 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 (B12P75/B12P76). 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. No detection limit was established for nitrate/nitrite.

- **Completeness**

  Data package No. H1488-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 holding times being missed (30 & 33 days), all nitrate/nitrite 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.

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: H1488	REVIEWER: TLI	DATE: 1/12/02	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate/nitrite	J	All	Missed holding time

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

GENERAL CHEMISTRY ANALYSIS, SOIL MATRIX, MG/KG

Project: BECHTEL-HANFORD
Laboratory: LLI
Case: SDG: H1488

Sample Number		B12P74		B12P75		B12P76		B12P77		B12P78		B12P79		B12P80		B12P81		B12P82		B12P83	
Location																					
Sample Date		8/24/01		8/27/01		8/27/01		8/27/01		8/27/01		8/27/01		8/24/01		8/24/01		8/24/01		8/24/01	
Inorganics	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Nitrate/Nitrite		0.20	UJ	0.18	J	0.20	UJ	0.20	UJ	0.59	J	0.20	UJ	0.56	J	0.20	UJ	0.25	J	0.21	J

Sample Number		B12P84		B12P85		B12P86		B12P87		B12P88		B12P89		B12P90		B12P91		B12P92		B12P93	
Remarks																					
Sample Date		8/24/01		8/24/01		8/24/01		8/27/01		8/24/01		8/27/01		8/27/01		8/27/01		8/24/01		8/27/01	
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Nitrate/Nitrite		0.19	UJ	0.19	UJ	0.19	UJ	0.65	J	0.19	UJ	5.9	J	6.0	J	14.8	J	0.20	UJ	7.6	J

Sample Number		B12P94		B12P95		B12P96															
Remarks																					
Sample Date		8/24/01		8/24/01		8/24/01															
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Nitrate/Nitrite		0.25	J	0.18	UJ	0.19	UJ														

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.

C-0000

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/26/01

CLIENT: TNUHANFORD B01-090 H1488

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

LVL LOT #: 0109L767

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12P74	% Solids	97.9	%	0.01	1.0
		Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
-002	B12P75	% Solids	99.6	%	0.01	1.0
		Nitrate Nitrite	0.18	MG/KG	0.17	1.0
-003	B12P76	% Solids	98.5	%	0.01	1.0
		Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
-004	B12P77	% Solids	100	%	0.01	1.0
		Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
-005	B12P78	% Solids	99.3	%	0.01	1.0
		Nitrate Nitrite	0.59	MG/KG	0.20	1.0
-006	B12P79	% Solids	92.5	%	0.01	1.0
		Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
-007	B12P80	% Solids	97.3	%	0.01	1.0
		Nitrate Nitrite	0.56	MG/KG	0.18	1.0
-008	B12P81	% Solids	98.9	%	0.01	1.0
		Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
-009	B12P82	% Solids	99.8	%	0.01	1.0
		Nitrate Nitrite	0.25	MG/KG	0.18	1.0
-010	B12P83	% Solids	98.6	%	0.01	1.0
		Nitrate Nitrite	0.21	MG/KG	0.17	1.0

1/12/02

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/26/01

CLIENT: TNUHANFORD B01-090 H1488

LVL LOT #: 0109L767

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	B12P84	% Solids	98.8	%	0.01	1.0
		Nitrate Nitrite	0.19 u	MG/KG	0.19	1.0
-012	B12P85	% Solids	99.2	%	0.01	1.0
		Nitrate Nitrite	0.19 u	MG/KG	0.19	1.0

1/12/02

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/26/01

CLIENT: TNUHANFORD B01-090 H1488

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

LVL LOT #: 0109L764

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B12P86	% Solids	98.4	%	0.01	1.0
		Nitrate Nitrite	0.19 u	MG/KG	0.19	1.0
-002	B12P87	% Solids	99.5	%	0.01	1.0
		Nitrate Nitrite	0.65	MG/KG	0.19	1.0
-003	B12P88	% Solids	98.2	%	0.01	1.0
		Nitrate Nitrite	0.19 u	MG/KG	0.19	1.0
-004	B12P89	% Solids	99.4	%	0.01	1.0
		Nitrate Nitrite	5.9	MG/KG	0.19	1.0
-005	B12P90	% Solids	99.4	%	0.01	1.0
		Nitrate Nitrite	6.0	MG/KG	0.19	1.0
-006	B12P91	% Solids	98.1	%	0.01	1.0
		Nitrate Nitrite	14.8	MG/KG	0.41	2.0
-007	B12P92	% Solids	97.8	%	0.01	1.0
		Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
-008	B12P93	% Solids	98.6	%	0.01	1.0
		Nitrate Nitrite	7.6	MG/KG	0.18	1.0
-009	B12P94	% Solids	97.9	%	0.01	1.0
		Nitrate Nitrite	0.25	MG/KG	0.20	1.0
-010	B12P95	% Solids	98.8	%	0.01	1.0
		Nitrate Nitrite	0.18 u	MG/KG	0.18	1.0

1/12/02

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/26/01

CLIENT: TNUHANFORD B01-090 H1488
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0109L764

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	B12P96	% Solids	98.1	%	0.01	1.0
		Nitrate Nitrite	0.19 u	MG/KG	0.19	1.0

J

1/12/02

000013A

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B01-090 H1488
LVL#: 0109L764; 0109L767

W.O.#: 11343-606-001-9999-00
Date Received: 09-06-01

INORGANIC NARRATIVE

1. This narrative covers the analyses of 23 soil samples.

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

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

4. The cooler temperatures were recorded on the chain of custody.

5. The method blank for Nitrate Nitrite was within the method criteria.

6. The Laboratory Control Sample (LCS) for Nitrate Nitrite was within the laboratory control limits.

7. The matrix spike recoveries for Nitrate Nitrite were within the 75-125% control limits.

9. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit with the exception of replicate analysis for Nitrate Nitrite sample B12P87 that was outside the control limit that may be attributed to sample inhomogeneity; replicate sample results for B12P87 were less than 10 times the reporting limit.

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

11. 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.

09-26-01
Date

Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

njp\i09-767

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 29 pages.

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Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-090 H1488

DATE RECEIVED: 09/06/01 LVL LOT # :0109L767

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12P81						
% SOLIDS	008	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	008	S	01LN3051	08/24/01	09/26/01	09/26/01
B12P82						
% SOLIDS	009	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	009	S	01LN3051	08/24/01	09/26/01	09/26/01
B12P83						
% SOLIDS	010	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	010	S	01LN3051	08/24/01	09/26/01	09/26/01
B12P84						
% SOLIDS	011	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	011	S	01LN3051	08/24/01	09/26/01	09/26/01
B12P85						
% SOLIDS	012	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	012	S	01LN3051	08/24/01	09/26/01	09/26/01
LAB QC:						
NITRATE NITRITE	MB1	S	01LN3051	N/A	09/26/01	09/26/01
NITRATE NITRITE	MB1 BS	S	01LN3051	N/A	09/26/01	09/26/01

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-090 H1488

DATE RECEIVED: 09/06/01

LVL LOT # :0109L767

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12P74						
% SOLIDS	001	S	01L%S118	08/24/01	09/11/01	09/12/01
% SOLIDS	001 REP	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	001	S	01LN3051	08/24/01	09/26/01	09/26/01
NITRATE NITRITE	001 REP	S	01LN3051	08/24/01	09/26/01	09/26/01
NITRATE NITRITE	001 MS	S	01LN3051	08/24/01	09/26/01	09/26/01
B12P75						
% SOLIDS	002	S	01L%S118	08/27/01	09/11/01	09/12/01
NITRATE NITRITE	002	S	01LN3051	08/27/01	09/26/01	09/26/01
B12P76						
% SOLIDS	003	S	01L%S118	08/27/01	09/11/01	09/12/01
NITRATE NITRITE	003	S	01LN3051	08/27/01	09/26/01	09/26/01
B12P77						
% SOLIDS	004	S	01L%S118	08/27/01	09/11/01	09/12/01
NITRATE NITRITE	004	S	01LN3051	08/27/01	09/26/01	09/26/01
B12P78						
% SOLIDS	005	S	01L%S118	08/27/01	09/11/01	09/12/01
NITRATE NITRITE	005	S	01LN3051	08/27/01	09/26/01	09/26/01
B12P79						
% SOLIDS	006	S	01L%S118	08/27/01	09/11/01	09/12/01
NITRATE NITRITE	006	S	01LN3051	08/27/01	09/26/01	09/26/01
B12P80						
% SOLIDS	007	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	007	S	01LN3051	08/24/01	09/26/01	09/26/01

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Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-090 H1488

DATE RECEIVED: 09/06/01

LVL LOT # :0109L764

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12P93						
% SOLIDS	008	S	01L%S118	08/27/01	09/11/01	09/12/01
NITRATE NITRITE	008	S	01LN3051	08/27/01	09/26/01	09/26/01
B12P94						
% SOLIDS	009	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	009	S	01LN3051	08/24/01	09/26/01	09/26/01
B12P95						
% SOLIDS	010	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	010	S	01LN3051	08/24/01	09/26/01	09/26/01
B12P96						
% SOLIDS	011	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	011	S	01LN3051	08/24/01	09/26/01	09/26/01
LAB QC:						
NITRATE NITRITE	MB1	S	01LN3051	N/A	09/26/01	09/26/01
NITRATE NITRITE	MB1 BS	S	01LN3051	N/A	09/26/01	09/26/01

OCT 2001 RECEIVED

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD B01-090 H1488

DATE RECEIVED: 09/06/01 LVL LOT # :0109L764

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B12P86						
% SOLIDS	001	S	01L%S118	08/24/01	09/11/01	09/12/01
% SOLIDS	001 REP	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	001	S	01LN3051	08/24/01	09/26/01	09/26/01
B12P87						
% SOLIDS	002	S	01L%S118	08/27/01	09/11/01	09/12/01
NITRATE NITRITE	002	S	01LN3051	08/27/01	09/26/01	09/26/01
NITRATE NITRITE	002 REP	S	01LN3051	08/27/01	09/26/01	09/26/01
NITRATE NITRITE	002 MS	S	01LN3051	08/27/01	09/26/01	09/26/01
B12P88						
% SOLIDS	003	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	003	S	01LN3051	08/24/01	09/26/01	09/26/01
B12P89						
% SOLIDS	004	S	01L%S118	08/27/01	09/11/01	09/12/01
NITRATE NITRITE	004	S	01LN3051	08/27/01	09/26/01	09/26/01
B12P90						
% SOLIDS	005	S	01L%S118	08/27/01	09/11/01	09/12/01
NITRATE NITRITE	005	S	01LN3051	08/27/01	09/26/01	09/26/01
B12P91						
% SOLIDS	006	S	01L%S118	08/27/01	09/11/01	09/12/01
NITRATE NITRITE	006	S	01LN3051	08/27/01	09/26/01	09/26/01
B12P92						
% SOLIDS	007	S	01L%S118	08/24/01	09/11/01	09/12/01
NITRATE NITRITE	007	S	01LN3051	08/24/01	09/26/01	09/26/01

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-090-002 | Page 1 of 2

Bechtel Hanford Inc.

Collector: RB Karkow

Company Contact: JD Fancher | Telephone No.: 373-9123

Project Coordinator: TRENT, SJ

Price Code: 8L | Date Turnaround: 21 Days

Air Quality ☐

Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil

Sampling Location: 116-N-3 Trench - Deep Zone

SAF No.: B01-090

Ice Chest No.: ETC 01-027

Field Logbook No.: EL-1524-1 | COA: R1325N2600

Method of Shipment: FED EX

Shipped To: ARMA/RECRA

Offsite Property No.: RSR# 106927

Bill of Lading/Air Bill No.: WA

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None
Type of Container	G	G/P	G/P
No. of Container(s)	1	1	
Volume	60mL	120mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	Sen Rev (1) in Special Instructions									
B12P86	SOIL	8-24-01	0930	X	X								B12TW4	D2-01
B12P87	SOIL	8-27-01	1045	X	X								B12TW6	D2-02
B12P88	SOIL	8-24-01	1010	X	X								B12TW4	D2-03
B12P89	SOIL	8-27-01	1100	X	X								B12TW4	D2-04
B12P90	SOIL	8-27-01	1100	X	X								B12TW4	D2-04

TIE TO:

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

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By (Sign/Print Name)	Date/Time
[illegible]	8/31/01 1110	Stored Inter #1A	8/31/01 1110
R. L. Thorson / Bechtel Hanford Inc. / 3728	9.6.01 0800	R. L. Thorson	9.5.01 0800
R. L. Thorson	9.5.01 0800	FED EX	
FED EX	9.6.01 0905	[illegible]	9.6.01 0905

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90; Total Sr; Tritium-3H TMS 8-27-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment.

RT 9.5.01

LABORATORY SECTION: Received By | Title | Date/Time

FINAL SAMPLE DISPOSITION: Disposal Method | Disposed By | Date/Time

BHI-EE-011 (10/99)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B01-090-002

Bechtel Hanford Inc.	Company Contact: JD Fancher	Telephone No.: 373-9123	Project Coordinator: TRENT, SJ
Collector: RB Kerkow	Sampling Location: 116-N-3 Trench - Deep Zone		SAF No.: B01-090
Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil	Field Logbook No.: EL-1524-1	COA: R1325N2600	Method of Shipment: PSD GV
Ice Chest No.: ERC 01-027	Offsite Property No.: PSR# 106927		Bill of Lading/Air Bill No.: N/A
Shipped To: TMA/RECRA 8/23/01			

Price Code: 8L

Data Turnaround: 21 Days

Air Quality ☐

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None									
Type of Container	G	G	G/P									
No. of Container(s)	1	1	1									
Volume	60mL	120mL	1000mL									
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO3/NO2 - 353.2	See Item (1) in Special Instructions.								TIE TO:	

Sample No.	Matrix *	Sample Date	Sample Time										
B12P91	SOIL	8-27-01	1120	X	X						B12TW6	D2-06
B12P92	SOIL	8-24-01	0950	X	X						B12TW4	D2-08
B12P93	SOIL	8-27-01	1110	X	X						B12TW6	D2-09
B12P94	SOIL	8-24-01	1450	X	X						B12TW6	D2-05
B12P95	SOIL	8-24-01	1405	X	X						B12TW4	D2-07

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	8/27/01 1110	Stored in Ref #1A	1610 8/27/01
Relinquished From IA 3728	9.5.01 0800	R. Thorson	9.5.01 0800
R. Thorson	9.5.01 0800	FEDEX	
Fed Ex	9-6-01 09:05	D. Smith	9-6-01 09:05

Sign/Print Name: [illegible] 8/27/01

SPECIAL INSTRUCTIONS

(1) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240), Americium-241, Strontium-89,90 Total Sr, Tritium - H3~~ TMS 8-27-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment.

RT 9.5.01

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

B01-090-002

Bechtel Hanford Inc.

Collector: RB Kerkow

Company Contact: JD Fancher — Telephone No.: 373-9123

Project Coordinator: TRENT, SJ

Price Code: 8L — Data Turnaround: 21 Days

Air Quality ☐

Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil

Sampling Location: 116-N-3 Trench - Deep Zone

SAF No.: B01-090

Ice Chest No.: ERC 01-027

Field Logbook No.: EL-1524-1

COA: R1325N2600

Method of Shipment: FED EX

Shipped To: TMA/RECRA

Offsite Property No.: RSR # 106927

Bill of Lading/Air Bill No.: NA

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None
Type of Container	G	G/P	G/T
No. of Container(s)	1	1	1
Volume	60mL	120mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	Sr-90 (1) In Special Requests					TIE TO:		
B12P96	SOIL	8-24-01	1440	X	X						B12TW4		DZ-10

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	8/27/01 0900	[illegible]	8/27/01 1010
[illegible]	0800	R.T. Thorn	0800 9-5-01
R.T. Thorn	9-5-01 0800	FEDEX	
FEDEX	9/6/01 / 09:05	[illegible]	9/6/01 09:05

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy [Cesium-137, Cobalt-60, Europium-154, Europium-155]; Isotopic Plutonium [Plutonium-238/240], Americium-241, Strontium-89,90 – Total Sr; Tritium - H3 TMS 8-27-01

Samples stored in Ref.# A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment.

RT 9-5-01

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 — Title — Date/Time

FINAL SAMPLE DISPOSITION — Disposal Method — Disposed By — Date/Time

BHI-EE-011 (10/99)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Bechtel Hanford Inc.

Company Contact: JD Fancher
Telephone No.: 373-9123
Project Coordinator: TRENT, SJ
Price Code: 8L
Data Turnaround: 21 Days
Air Quality ☐

Collector: B Kerkow
Project Designation: 00-NR-1 TSD Sites R. A. Verification Sampling - Soil
Sampling Location: 116-N-3 Trench Shallow Zone
SAF No.: B01-090
Method of Shipment: FED EX
Chest No.: SM1-599
Field Logbook No.: EL-1524-1
COA: R1325N2600
Bill of Lading/Air Bill No.: L2357954 - 7078
Offsite Property No.: A010366
Shipped To: RCRA/RECRA

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None
Type of Container	G	G/P	G/P
No. of Container(s)	1	1	
Volume	60mL	120mL	1000mL
SAMPLE ANALYSIS	Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See Note (1) in Special Instructions.

Sample No.	Matrix *	Sample Date	Sample Time											
B12P74	SOIL	8-24-01	1000	X	X								B12PF7	S2-03
B12P75	SOIL	8-27-01	1015	X	X								B12TW1	S2-04
B12P76	SOIL	8-27-01	1015	X	X								B12TW1	S2-04
B12P77	SOIL	8-27-01	0915	X	X								B12TW1	S2-04
B12P78	SOIL	8-27-01	1010	X	X								B12TW1	S2-06

TIGTO:

CHAIN OF POSSESSION

Relinquished By (Sign/Print Name)	Date/Time	Received By (Sign/Print Name)	Date/Time
[illegible]	8/27/01 1410	Stored in Ref # 1A	8/27/01 1410
Removed from Ref 1A 3728	9.5.01 0900	R Thoren	9.5.01 0900
R Thoren	9.5.01 0900	FED EX	
FED EX	9-6-01 1455	[illegible]	9-6-01 1455

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89,90 — Total Sr; Tritium-3H TMJ 8-27-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment.
RT 9.5.01

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

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

Title

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: RB Kerkow

Project Designation: 100-NR-1 TSD Sites R. A. Verification Sampling - Soil

Ice Chest No.: Sm 1-849

Shipped To: RMA/RECRA

Company Contact: JD Fancher

Telephone No.: 373-9123

Sampling Location: 116-N-3 Trench Shallow Zone

Field Logbook No.: EL-1524-1

COA: R1325N2600

Offsite Property No.: A010366

Project Coordinator: TRENT, SJ

SAF No.: B01-090

Price Code: 8L

Data Turnaround: 21 Days

Air Quality ☐

Method of Shipment: FED EX

Bill of Lading/Air Bill No.: 4235 7954 - 7078

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

SAMPLE ANALYSIS														
Preservation				None	Cool 4C	None								
Type of Container				G	G/P	G/P								
No. of Container(s)				1	1	1								
Volume				60mL	120mL	1000mL								
				Mercury - 7471 - (CV)	NO2/NO3 - 353.2	See Inf. (1) in Special Instructions.								
Sample No.	Matrix *	Sample Date	Sample Time											
B12P79	SOIL	8-27-01	1035	X	X							B12TW	1	S2-07
B12P80	SOIL	8-24-01	0940	X	X							B12PD	9	S2-08
B12P81	SOIL	8-24-01	1420	X	X							B12PF	7	S2-01
B12P82	SOIL	8-24-01	1445	X	X							B12PF	7	S2-02
B12P83	SOIL	8-24-01	1350	X	X							B12PD	9	S2-05

TIETD:

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	8/27/01 1010	[illegible] #19	8/27/01 1410
Removed from 3728 #19	9.5.01 0900	R.L. Thorson	9.5.01 0900
R.L. Thorson	9.5.01 0900	FED EX	
FED EX	9-6-01 1455	[illegible]	9-6-01 1455

Sign/Print Name: [illegible]

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240), Americium-241, Strontium-89,90 – Total Sr, Tritium – HTO MJ 8-27-01

Samples stored in Ref.# 1A at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment. RT 9.5.01

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	RB Kerkow
Company Contact	JD Fancher
Telephone No.	373-9123
Project Coordinator	TRENT, SJ
Price Code	8L
Data Turnaround	21 Days
Project Designation	100-NR-1 TSD Sites R. A. Verification Sampling - Soil
Sampling Location	116-N-3 Trench Shallow Zone
SAF No.	B01-090
Air Quality	☐
Ice Chest No.	SM1-549
Field Logbook No.	EL-1524-1
COA	R1325N2600
Method of Shipment	FED EX
Shipped To	TMA/RECRA
Offsite Property No.	A010366
Bill of Lading/Air Bill No.	4238954-7078

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C	None
Type of Container	G	G/P	G/P
No. of Container(s)	1	1	
Volume	60mL	120mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Mercury - 7471 - (CV)	NO3/NO2 - 353.2	Sections (1) in Special Instructions.									
B12P84	SOIL	8-24-01	1430	X	X								B12PF	7	S2-09
B12P85	SOIL	8-24-01	1400	X	X								B12PD	9	S2-10

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	8/27/01 1410	[illegible] IA	8/27/01 1410
Ref IA 3728	9.5.01 0900	R Thoer	9.5.01 0900
R Thoer	9.5.01 0900	FED EX	
FED EX	9-6-01 1455	[illegible]	9-6-01 1455

SPECIAL INSTRUCTIONS

(1) ~~Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-154, Europium-155); Isotopic Plutonium (Plutonium-239/240); Americium-241; Strontium-89/90 — Total Sr; Tritium~~ HB 1113 8-27-01

Samples stored in Ref.# IA at the 3728 Shipping Facility on 8/27/01. Collector not available to relinquish samples on 9/5/01 for shipment. RT 9.5.01

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	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

BHI-EE-011 (10/99)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100NR1		116-N-3	DATA PACKAGE: H1488		
VALIDATOR: TLI		LAB: LL1		DATE:	
CASE:			SDG: H1488		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO_3/NO_2
Sulfate	TDS	TKN	Phosphate		

SAMPLES/MATRIX						
B12P74	B12P75	B12P76	B12P77	B12P78	B12P79	B12P80
B12P81	B12P82	B12P83	B12P84	B12P85	B12P86	B12P87
B12P88	B12P89	B12P90	B12P91	B12P92	B12P93	B12P94
B12P95	B12P96					
						Soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments:

2. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Levels D and E)

Initial calibrations performed on all instruments? ..... Yes No N/A

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

ICV and CCV checks performed on all instruments? ..... Yes No N/A

ICV and CCV checks acceptable? ..... Yes No N/A

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

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

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

Comments:

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

3. BLANKS (Levels B, C, D, and E)

ICB and CCB checks performed for all applicable analyses? (Levels D, E) ..... Yes No N/A
ICB and CCB results acceptable? (Levels D, E) ..... Yes No N/A
Laboratory blanks analyzed? ..... Yes No N/A
Laboratory blank results acceptable? ..... Yes No N/A
Field blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Comments:

4. ACCURACY (Levels C, D, and E)

Spike samples analyzed? ..... Yes No N/A
Spike recoveries acceptable? ..... Yes No N/A
Sike standards NIST traceable? (Levels D, E) ..... Yes No N/A
Spike standards expired? (Levels D, E) ..... Yes No N/A
LCS/BSS samples analyzed? ..... Yes No N/A
LCS/BSS results acceptable? ..... Yes No N/A
Standards traceable? (Levels D, E) ..... Yes No N/A
Standards expired? (Levels D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A
Performance audit sample(s) analyzed? ..... Yes No N/A
Performance audit sample results acceptable? ..... Yes No N/A
Comments:

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

5. PRECISION (Levels C, D, and E)

Duplicate RPD values acceptable? ..... Yes No N/A

Duplicate results acceptable? ..... Yes No N/A

MS/MSD standards NIST traceable? (Levels D, E) ..... Yes No N/A

MS/MSD standards expired? (Levels D, E) ..... Yes No N/A

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

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

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

Comments:

6. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A

Sample holding times acceptable? ..... Yes No N/A

Comments: 33 & 30 day J all

000029

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

Results reported for all requested analyses? ..... Yes No N/A

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

Samples properly prepared? (Levels D, E) ..... Yes No N/A

Detection limits meet RDL? ..... Yes No N/A

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

Comments:

Appendix 6

Additional Documentation Requested by Client

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/26/01

CLIENT: TNUHANFORD B01-090 H1488

LVL LOT #: 0109L764

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LN3051-MB1	Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/26/01

CLIENT: TNUHANFORD B01-090 H1488

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

LVL LOT #: 0109L764

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	B12P87	Nitrate Nitrite	5.4	0.65	4.8	98.0	1.0
BLANK10	01LN3051-MB1	Nitrate Nitrite	5.2	0.20u	5.0	103.0	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/26/01

CLIENT: TNUHANFORD B01-090 H1488

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

LVL LOT #: 0109L764

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	B12P86	% Solids	98.4	98.4	0.00	1.0
-002REP	B12P87	Nitrate Nitrite	0.65	0.85	26.7	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/26/01

CLIENT: TNUHANFORD B01-090 H1488

LVL LOT #: 0109L767

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LN3051-MB1	Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/26/01

CLIENT: TNUHANFORD B01-090 H1488

LVL LOT #: 0109L767

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	B12P74	Nitrate Nitrite	4.8	0.20u	5.1	94.2	1.0
BLANK10	01LN3051-MB1	Nitrate Nitrite	5.2	0.20u	5.0	103.0	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/26/01

CLIENT: TNUHANFORD B01-090 H1488

LVL LOT #: 0109L767

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B12P74	% Solids	97.9	97.8	0.14	1.0
		Nitrate Nitrite	0.20u	0.20u	NC	1.0

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