0059801

SAF-B03-015
Remaining Sites Confirmation Sampling-Soil
FINAL VALIDATION PACKAGE

MAIL COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan H9-01 BT 5/20
INITIAL/DATE

COMMENTS: (PLEASE INCLUDE THE FOLLOWING ON THE COVER SHEET)

SDG H2146 SAF-B03-015

Sample Location/Waste Site: 100-B-1

RECEIVED
JUL 14 2003
EDMC

Date: 12 May 2003
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Waste Sites Confirmation Sampling - Soil - Waste Site 100-B-1
Subject: Radiochemistry - Data Package No. H2146-EB (SDG No. H2146)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2146-EB which was prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J00KY1	4/2/03	Soil	C	Gamma Spectroscopy
J00KY0	4/2/03	Soil	C	See note 1
J00KX8	4/2/03	Soil	C	See note 1
J00KX9	4/2/03	Soil	C	See note 1
J00KX6	4/2/03	Soil	C	See note 1
J00KX7	4/2/03	Soil	C	See note 1
J00KW9	4/3/03	Soil	C	See note 1
J00KX2	4/3/03	Soil	C	See note 1
J00KX3	4/3/03	Soil	C	See note 1
J00KX4	4/3/03	Soil	C	See note 1
J00KX0	4/3/03	Soil	C	See note 1
J00KX1	4/7/03	Soil	C	See note 1
J00KX5	4/3/03	Soil	C	See note 1

1- Gamma spectroscopy, gross alpha & beta.

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 December 2001) and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J00KY1) was submitted for analysis. 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. 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.

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% (35% for gross alpha and gross beta), no qualification is required. If either activity (concentration) is less than five times the CRDL, the RPD control limit is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicate

One set of field duplicate samples (J00KW9/J00KX0) were submitted for analysis. Field duplicate results 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 target detection limits (TDLs) to ensure that laboratory detection levels meet the required criteria. Twenty-six analytes were reported above their TDL. Under the BHI statement of work, no qualification is required. All other reported results met the analyte specific TDL.

- **Completeness**

  Data package No. H2146 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

Twenty-six analytes were reported above their TDL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incoroprated, March 2003.

DOE/RL-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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: H2146	REVIEWER: TLI	DATE: 5/12/03	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: H2146																
Sample Number		J00KY0		J00KY1		J00KX8		J00KX9		J00KX6		J00KX7		J00KW9		J00KX2	
Remarks				E. Blank													
Location		100-B-1		100-B-1		100-B-1		100-B-1		100-B-1		100-B-1		100-B-1		100-B-1	
Sample Date		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/3/03		4/3/03	
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross alpha		5.04		NA		7.04		2.31	U	7.15		0.943	U	3.18	U	4.16	
Gross beta		16.5		NA		15.5		20.8		17.2		17.4		17.2		15.6	
Potassium-40		14.6		4.51		16.5		15.0		13.6		10.7		14.1		13.1	
Cobalt 60	0.05	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Cesium 137	0.05	U	U	U	U	U	U	U	U	0.130	U	U	U	0.027		0.094	
Radium-226		0.572		0.129		0.700		0.616		0.467		0.378		0.553		0.569	
Radium-228		0.855		0.162		1.11		0.907		0.750		0.560		0.891		0.911	
Europium 152	0.1	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*
Europium 155	0.1	U	U	U	U	U	U*	U	U	U	U	U	U	U	U	U	U*
Thorium-228		0.731		0.145		0.877		1.11		0.874		0.479		0.737		0.760	
Thorium-232		0.855		0.162		1.11		0.907		0.750		0.560		0.89		0.911	
Uranium-235	1	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Uranium-238	1	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*	U	U*
Americium-241	1	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

000010

* - 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.

NA = Not analyzed

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G)

Project: BECHTEL-HANFORD																	
Laboratory: EB																	
Case	SDG: H2146																
Sample Number		J00KX3		J00KX4		J00KX0		J00KX1		J00KX5							
Remarks						Duplicate											
		100-B-1		100-B-1		100-B-1		100-B-1		100-B-1							
Sample Date		4/3/03		4/3/03		4/3/03		4/7/03		4/3/03							
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross alpha		1.80	U	3.36	U	2.85		4.93		5.20							
Gross beta		22.9		11.7		18.6		10.6		16.8							
Potassium-40		9.23		7.65		12.4		10.2		12.1							
Cobalt 60	0.05	U	U*	U	U*	U	U	U	U	U	U						
Cesium 137	0.05	U	U*	U	U	U	U	U	U	U	U						
Radium-226		0.397		0.200		0.543		0.359		0.499							
Radium-228		0.719		0.415		0.843		0.582		0.854							
Europium 152	0.1	U	U*	U	U*	U	U	U	U	U	U						
Europium 154	0.1	U	U*	U	U*	U	U	U	U	U	U						
Europium 155	0.1	U	U*	U	U*	U	U	U	U	U	U						
Thorium-228		0.497		0.316		0.703		0.494		0.652							
Thorium-232		0.719		0.415		0.843		0.582		0.854							
Uranium-235	1	U	U	U	U	U	U	U	U	U	U						
Uranium-238	1	U	U*	U	U*	U	U*	U	U*	U	U*						
Americium-241	1	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.

NA = Not analyzed

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-001 J00KW9

DATA SHEET

SDG	7480	Client/Case no	Hanford	SDG H2146	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R304055-01	Client sample id	J00KW9		
Dept sample id	7480-001	Location/Matrix	100-B-1	SOLID	
Received	04/09/03	Collected/Weight	04/03/03 12:15	1001 g	
% solids	94.6	Custody/SAF No	B03-015-27	B03-015	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	3.18	2.8	3.8	10	U	93A
Gross Beta	12587-47-2	17.2	4.2	5.4	15		93B
Potassium 40	13966-00-2	14.1	0.72	0.24			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	0.027	0.014	0.020	0.10		GAM
Radium 226	13982-63-3	0.553	0.059	0.043			GAM
Radium 228	15262-20-1	0.891	0.10	0.097			GAM
Europium 152	14683-23-9	U		0.056	0.10	U	GAM
Europium 154	15585-10-1	U		0.071	0.10	U	GAM
Europium 155	14391-16-3	U		0.079	0.10	U	GAM
Thorium 228	14274-82-9	0.737	0.033	0.026			GAM
Thorium 232	TH-232	0.891	0.10	0.097			GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		2.6		U	GAM
Americium 241	14596-10-2	U		0.16		U	GAM

Remaining Sites Confirmation Smpl.

5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-002 J00KX2

DATA SHEET

SDG	7480	Client/Case no	Hanford SDG H2146
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304055-02	Client sample id	J00KX2
Dept sample id	7480-002	Location/Matrix	100-B-1 SOLID
Received	04/09/03	Collected/Weight	04/03/03 10:41 1019 g
% solids	96.0	Custody/SAF No	B03-015-27 B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	4.16	3.1	3.3	10		93A
Gross Beta	12587-47-2	15.6	4.2	5.5	15		93B
Potassium 40	13966-00-2	13.1	0.77	0.38			GAM
Cobalt 60	10198-40-0	U		0.040	0.050	U	GAM
Cesium 137	10045-97-3	0.094	0.029	0.035	0.10		GAM
Radium 226	13982-63-3	0.569	0.070	0.068			GAM
Radium 228	15262-20-1	0.911	0.16	0.14			GAM
Europium 152	14683-23-9	U		0.081	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Thorium 228	14274-82-9	0.760	0.047	0.046			GAM
Thorium 232	TH-232	0.911	0.16	0.14			GAM
Uranium 235	15117-96-1	U		0.16		U	GAM
Uranium 238	U-238	U		4.3		U	GAM
Americium 241	14596-10-2	U		0.34		U	GAM

Remaining Sites Confirmation Smpl.

RPM 5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-003 J00KX3

DATA SHEET

SDG	7480	Client/Case no	Hanford SDG H2146
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304055-03	Client sample id	J00KX3
Dept sample id	7480-003	Location/Matrix	100-B-1 SOLID
Received	04/09/03	Collected/Weight	04/03/03 10:59 1054 g
% solids	94.8	Custody/SAF No	B03-015-27 B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	1.80	2.5	3.4	10	U	93A
Gross Beta	12587-47-2	22.9	5.0	6.6	15		93B
Potassium 40	13966-00-2	9.23	1.3	0.73			GAM
Cobalt 60	10198-40-0	U		0.077	0.050	U	GAM
Cesium 137	10045-97-3	U		0.062	0.10	U	GAM
Radium 226	13982-63-3	0.397	0.12	0.13			GAM
Radium 228	15262-20-1	0.719	0.26	0.24			GAM
Europium 152	14683-23-9	U		0.17	0.10	U	GAM
Europium 154	15585-10-1	U		0.25	0.10	U	GAM
Europium 155	14391-16-3	U		0.17	0.10	U	GAM
Thorium 228	14274-82-9	0.497	0.099	0.12			GAM
Thorium 232	TH-232	0.719	0.26	0.24			GAM
Uranium 235	15117-96-1	U		0.26		U	GAM
Uranium 238	U-238	U		7.7		U	GAM
Americium 241	14596-10-2	U		0.36		U	GAM

Remaining Sites Confirmation Smpl.

pw
5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-004 J00KX4

DATA SHEET

SDG	7480	Client/Case no	Hanford	SDG H2146
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R304055-04	Client sample id	J00KX4	
Dept sample id	7480-004	Location/Matrix	100-B-1	SOLID
Received	04/09/03	Collected/Weight	04/03/03 09:20	1023 g
% solids	95.9	Custody/SAF No	B03-015-27	B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	3.36	3.2	4.0	10	U	93A
Gross Beta	12587-47-2	11.7	4.1	5.7	15		93B
Potassium 40	13966-00-2	7.65	2.2	0.55			GAM
Cobalt 60	10198-40-0	U		0.072	0.050	U	GAM
Cesium 137	10045-97-3	U		0.049	0.10	U	GAM
Radium 226	13982-63-3	0.200	0.16	0.10			GAM
Radium 228	15262-20-1	0.415	0.19	0.19			GAM
Europium 152	14683-23-9	U		0.12	0.10	U	GAM
Europium 154	15585-10-1	U		0.14	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Thorium 228	14274-82-9	0.316	0.071	0.057			GAM
Thorium 232	TH-232	0.415	0.19	0.19			GAM
Uranium 235	15117-96-1	U		0.21		U	GAM
Uranium 238	U-238	U		6.1		U	GAM
Americium 241	14596-10-2	U		0.21		U	GAM

Remaining Sites Confirmation Smpl.

RW 5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-005 J00KX0

DATA SHEET

SDG	7480	Client/Case no	Hanford	SDG H2146	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R304055-05	Client sample id	J00KX0		
Dept sample id	7480-005	Location/Matrix	100-B-1	SOLID	
Received	04/09/03	Collected/Weight	04/03/03 12:15	1046 g	
% solids	94.7	Custody/SAF No	B03-015-27	B03-015	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	2.85	3.1	4.0	10	U	93A
Gross Beta	12587-47-2	18.6	5.0	6.9	15		93B
Potassium 40	13966-00-2	12.4	0.61	0.27			GAM
Cobalt 60	10198-40-0	U		0.029	0.050	U	GAM
Cesium 137	10045-97-3	U		0.030	0.10	U	GAM
Radium 226	13982-63-3	0.543	0.056	0.054			GAM
Radium 228	15262-20-1	0.843	0.13	0.12			GAM
Europium 152	14683-23-9	U		0.061	0.10	U	GAM
Europium 154	15585-10-1	U		0.093	0.10	U	GAM
Europium 155	14391-16-3	U		0.090	0.10	U	GAM
Thorium 228	14274-82-9	0.703	0.034	0.031			GAM
Thorium 232	TH-232	0.843	0.13	0.12			GAM
Uranium 235	15117-96-1	U		0.13		U	GAM
Uranium 238	U-238	U		3.1		U	GAM
Americium 241	14596-10-2	U		0.26		U	GAM

Remaining Sites Confirmation Smpl.

5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-006 J00KX1

DATA SHEET

SDG	7480	Client/Case no	Hanford	SDG H2146
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R304055-06	Client sample id	J00KX1	
Dept sample id	7480-006	Location/Matrix	100-B-1	SOLID
Received	04/09/03	Collected/Weight	04/07/03 08:41 1192 g	
% solids	95.1	Custody/SAF No	B03-015-29 B03-015	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	4.93	3.3	3.7	10		93A
Gross Beta	12587-47-2	10.6	4.0	5.9	15		93B
Potassium 40	13966-00-2	10.2	0.54	0.22			GAM
Cobalt 60	10198-40-0	U		0.026	0.050	U	GAM
Cesium 137	10045-97-3	U		0.024	0.10	U	GAM
Radium 226	13982-63-3	0.359	0.049	0.046			GAM
Radium 228	15262-20-1	0.582	0.11	0.10			GAM
Europium 152	14683-23-9	U		0.057	0.10	U	GAM
Europium 154	15585-10-1	U		0.087	0.10	U	GAM
Europium 155	14391-16-3	U		0.069	0.10	U	GAM
Thorium 228	14274-82-9	0.494	0.032	0.028			GAM
Thorium 232	TH-232	0.582	0.11	0.10			GAM
Uranium 235	15117-96-1	U		0.085		U	GAM
Uranium 238	U-238	U		3.4		U	GAM
Americium 241	14596-10-2	U		0.088		U	GAM

Remaining Sites Confirmation Smpl.

Per 5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-007 J00KX5

DATA SHEET

SDG	7480	Client/Case no	Hanford		SDG H2146
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R304055-07	Client sample id	J00KX5		
Dept sample id	7480-007	Location/Matrix	100-B-1		SOLID
Received	04/09/03	Collected/Weight	04/03/03 13:20	1087 g	
% solids	94.5	Custody/SAF No	B03-015-33	B03-015	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	5.20	3.4	3.7	10		93A
Gross Beta	12587-47-2	16.8	4.7	6.6	15		93B
Potassium 40	13966-00-2	12.1	0.66	0.27			GAM
Cobalt 60	10198-40-0	U		0.033	0.050	U	GAM
Cesium 137	10045-97-3	U		0.028	0.10	U	GAM
Radium 226	13982-63-3	0.499	0.065	0.060			GAM
Radium 228	15262-20-1	0.854	0.16	0.14			GAM
Europium 152	14683-23-9	U		0.066	0.10	U	GAM
Europium 154	15585-10-1	U		0.10	0.10	U	GAM
Europium 155	14391-16-3	U		0.083	0.10	U	GAM
Thorium 228	14274-82-9	0.652	0.039	0.034			GAM
Thorium 232	TH-232	0.854	0.16	0.14			GAM
Uranium 235	15117-96-1	U		0.10		U	GAM
Uranium 238	U-238	U		4.2		U	GAM
Americium 241	14596-10-2	U		0.11		U	GAM

Remaining Sites Confirmation Smpl.

pkr
5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-008 J00KY0

DATA SHEET

SDG	7480	Client/Case no	Hanford SDG H2146
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304055-08	Client sample id	J00KY0
Dept sample id	7480-008	Location/Matrix	100-B-1 SOLID
Received	04/09/03	Collected/Weight	04/02/03 12:35 1036 g
% solids	93.8	Custody/SAF No	B03-015-38 B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	5.04	3.5	4.4	10		93A
Gross Beta	12587-47-2	16.5	5.6	8.2	15		93B
Potassium 40	13966-00-2	14.6	0.75	0.22			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	U		0.022	0.10	U	GAM
Radium 226	13982-63-3	0.572	0.058	0.038			GAM
Radium 228	15262-20-1	0.855	0.088	0.075			GAM
Europium 152	14683-23-9	U		0.057	0.10	U	GAM
Europium 154	15585-10-1	U		0.077	0.10	U	GAM
Europium 155	14391-16-3	U		0.086	0.10	U	GAM
Thorium 228	14274-82-9	0.731	0.034	0.028			GAM
Thorium 232	TH-232	0.855	0.088	0.075			GAM
Uranium 235	15117-96-1	U		0.11		U	GAM
Uranium 238	U-238	U		2.7		U	GAM
Americium 241	14596-10-2	U		0.16		U	GAM

Remaining Sites Confirmation Smpl.

Rc
5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-009 J00KX8

DATA SHEET

SDG	7480	Client/Case no	Hanford SDG H2146
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304055-09	Client sample id	J00KX8
Dept sample id	7480-009	Location/Matrix	100-B-1 SOLID
Received	04/09/03	Collected/Weight	04/02/03 08:50 873.9 g
% solids	94.5	Custody/SAF No	B03-015-38 B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	7.04	3.8	4.3	10		93A
Gross Beta	12587-47-2	15.5	5.5	8.2	15		93B
Potassium 40	13966-00-2	16.5	0.87	0.42			GAM
Cobalt 60	10198-40-0	U		0.040	0.050	U	GAM
Cesium 137	10045-97-3	U		0.040	0.10	U	GAM
Radium 226	13982-63-3	0.700	0.080	0.076			GAM
Radium 228	15262-20-1	1.11	0.17	0.16			GAM
Europium 152	14683-23-9	U		0.092	0.10	U	GAM
Europium 154	15585-10-1	U		0.14	0.10	U	GAM
Europium 155	14391-16-3	U		0.15	0.10	U	GAM
Thorium 228	14274-82-9	0.877	0.052	0.050			GAM
Thorium 232	TH-232	1.11	0.17	0.16			GAM
Uranium 235	15117-96-1	U		0.18		U	GAM
Uranium 238	U-238	U		5.0		U	GAM
Americium 241	14596-10-2	U		0.36		U	GAM

Remaining Sites Confirmation Smpl.

PW
5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-010 J00KX9

DATA SHEET

SDG	7480	Client/Case no	Hanford	SDG H2146
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R304055-10	Client sample id	J00KX9	
Dept sample id	7480-010	Location/Matrix	100-B-1	SOLID
Received	04/09/03	Collected/Weight	04/02/03 10:10	1041 g
% solids	94.8	Custody/SAF No	B03-015-38	B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	2.31	2.6	3.4	10	U	93A
Gross Beta	12587-47-2	20.8	4.4	5.3	15		93B
Potassium 40	13966-00-2	15.0	0.93	0.30			GAM
Cobalt 60	10198-40-0	U		0.038	0.050	U	GAM
Cesium 137	10045-97-3	U		0.026	0.10	U	GAM
Radium 226	13982-63-3	0.616	0.063	0.056			GAM
Radium 228	15262-20-1	0.907	0.13	0.13			GAM
Europium 152	14683-23-9	U		0.067	0.10	U	GAM
Europium 154	15585-10-1	U		0.10	0.10	U	GAM
Europium 155	14391-16-3	U		0.062	0.10	U	GAM
Thorium 228	14274-82-9	1.11	0.056	0.052			GAM
Thorium 232	TH-232	0.907	0.13	0.13			GAM
Uranium 235	15117-96-1	U		0.10		U	GAM
Uranium 238	U-238	U		3.6		U	GAM
Americium 241	14596-10-2	U		0.040		U	GAM

Remaining Sites Confirmation Smpl.

RV
5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-011 J00KX6

DATA SHEET

SDG	7480	Client/Case no	Hanford SDG H2146
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R304055-11	Client sample id	J00KX6
Dept sample id	7480-011	Location/Matrix	100-B-1 SOLID
Received	04/09/03	Collected/Weight	04/02/03 13:40 1109 g
% solids	96.1	Custody/SAF No	B03-015-38 B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	7.15	3.7	4.2	10		93A
Gross Beta	12587-47-2	17.2	4.3	5.5	15		93B
Potassium 40	13966-00-2	13.6	0.84	0.23			GAM
Cobalt 60	10198-40-0	U		0.027	0.050	U	GAM
Cesium 137	10045-97-3	0.130	0.025	0.028	0.10		GAM
Radium 226	13982-63-3	0.467	0.051	0.045			GAM
Radium 228	15262-20-1	0.750	0.11	0.10			GAM
Europium 152	14683-23-9	U		0.056	0.10	U	GAM
Europium 154	15585-10-1	U		0.075	0.10	U	GAM
Europium 155	14391-16-3	U		0.070	0.10	U	GAM
Thorium 228	14274-82-9	0.874	0.045	0.043			GAM
Thorium 232	TH-232	0.750	0.11	0.10			GAM
Uranium 235	15117-96-1	U		0.082		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Americium 241	14596-10-2	U		0.033		U	GAM

Remaining Sites Confirmation Smpl.

R 5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-012 J00KX7

DATA SHEET

SDG	7480	Client/Case no	Hanford	SDG H2146
Contact	Melissa C. Mannion	Contract	No. 630	
Lab sample id	R304055-12	Client sample id	J00KX7	
Dept sample id	7480-012	Location/Matrix	100-B-1	SOLID
Received	04/09/03	Collected/Weight	04/02/03 15:10	1199 g
% solids	95.0	Custody/SAF No	B03-015-38	B03-015

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	0.943	2.4	3.8	10	U	93A
Gross Beta	12587-47-2	17.4	4.8	6.6	15		93B
Potassium 40	13966-00-2	10.7	0.65	0.17			GAM
Cobalt 60	10198-40-0	U		0.021	0.050	U	GAM
Cesium 137	10045-97-3	U		0.017	0.10	U	GAM
Radium 226	13982-63-3	0.378	0.054	0.037			GAM
Radium 228	15262-20-1	0.560	0.085	0.083			GAM
Europium 152	14683-23-9	U		0.043	0.10	U	GAM
Europium 154	15585-10-1	U		0.057	0.10	U	GAM
Europium 155	14391-16-3	U		0.064	0.10	U	GAM
Thorium 228	14274-82-9	0.479	0.027	0.022			GAM
Thorium 232	TH-232	0.560	0.085	0.083			GAM
Uranium 235	15117-96-1	U		0.085		U	GAM
Uranium 238	U-238	U		2.0		U	GAM
Americium 241	14596-10-2	U		0.12		U	GAM

Remaining Sites Confirmation Smpl.

RW 5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-013 J00KY1

DATA SHEET

SDG	7480	Client/Case no	Hanford	SDG H2146	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R304055-13	Client sample id	J00KY1		
Dept sample id	7480-013	Location/Matrix	100-B-1	SOLID	
Received	04/09/03	Collected/Weight	04/02/03 08:48	917.2 g	
% solids	100.0	Custody/SAF No	B03-015-39	B03-015	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Potassium 40	13966-00-2	4.51	0.44	0.10			GAM
Cobalt 60	10198-40-0	U		0.013	0.050	U	GAM
Cesium 137	10045-97-3	U		0.011	0.10	U	GAM
Radium 226	13982-63-3	0.129	0.036	0.024			GAM
Radium 228	15262-20-1	0.162	0.045	0.046			GAM
Europium 152	14683-23-9	U		0.027	0.10	U	GAM
Europium 154	15585-10-1	U		0.036	0.10	U	GAM
Europium 155	14391-16-3	U		0.042	0.10	U	GAM
Thorium 228	14274-82-9	0.145	0.016	0.014			GAM
Thorium 232	TH-232	0.162	0.045	0.046			GAM
Uranium 235	15117-96-1	U		0.054		U	GAM
Uranium 238	U-238	U		1.1		U	GAM
Americium 241	14596-10-2	U		0.076		U	GAM

Remaining Sites Confirmation Smpl.

5/7/03

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2146 was composed of thirteen solid (soil) samples designated under SAF No. B03-015 with a Project Designation of: Remaining Sites Confirmation Sampling – Soil, 100-B-1.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on April 16, 2003. The electronic data deliverable (EDD) was transmitted to BHI via e-mail on April 16, 2003.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Gamma Spectroscopy Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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

Melissa Mannion
Melissa C. Mannion
Program Manager

7/28/3
Date

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B03-015-27 | Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1 H2146 (7480)	SAF No.: B03-015	
Ice Chest No.: ERC 02 406	Field Logbook No.: EL-1578	COA: C17HXB671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030192	Bill of Lading/Air Bill No.: 7922 2458 5238	

POSSIBLE SAMPLE HAZARDS/REMARKS: Radioactive Tie to 200 KW7

Special Handling and/or Storage: None

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			

Sample No.	Matrix *	Sample Date	Sample Time								
J00KW9	SOIL	4-3-03	1215	X	X	X	X	X	X	Area 1 surface soil	
J00KX2	Soil	4-3-03	1041	X	X	X	X	X	X	Area 2 surface soil	
J00KX3	Soil	4-3-03	1059	X	X	X	X	X	X	bottom of trench	
J00KX4	Soil	4-3-03	0930	X	X	X	X	X	X	"	
J00KX0	Soil	4-3-03	1215	X	X	X	X	X	X	Area 1 surface soil	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Tony Bowers Bowers	4-3-03/1330	RJF 3C	4-3-03/1330
3C 3728	4-8-03 1000	RGood, RGFahlberg	4-8-03 1000
RGood, RGFahlberg	4-8-03 1000	FedEx	
FED EX		[illegible]	1000 4-9-03

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta; ~~Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89/90; Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)~~ AC 5/31/03

(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref# 3C on 4/8/03

Matrix *: S-Soil; SD-Sediment; SO-Solid; SL-Sludge; W-Water; O-Oil; A-Air; DS-Drum Sol; DL-Drum Liq; 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 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-29	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1 H2146 (7480)	SAF No.: B03-015	
Ice Chest No.: ERC-02-406	Field Logbook No.: EL-1578	COA: C17HXB671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030 192	Bill of Lading/Air Bill No.: 7922 2458 5731	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
TiCTB 700 KW7

Special Handling and/or Storage
None

SAMPLE ANALYSIS												
Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
	See item (1) in Special Instructions	See item (2) in Special Instructions	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			
Sample No.	Matrix *	Sample Date	Sample Time									
J00KX1	SOIL	4-7-03	0841	X	X	X	X	X		X	area sub-surface soil	

000028

RB 4-8-03

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible] Bowers	4-7-03/1040	A of 3C 3728	4-7-03/1040
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time 1000
3C 3728 4-8-03	1000	K. Fahlberg R. Fahlberg	4-8-03
Relinquished By/Removed From	Date/Time 1000	Received By/Stored In	Date/Time
R. Fahlberg R. Fahlberg	4-8-03	Fed Ex	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fed Ex		[illegible]	1000 4-9-03
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728
Ref # 3C on 4/8/03

Matrix *
S=Soil
SE=Sediment
SD=Solid
SL=Sludge
W = Water
O=Oil
A=Air
DS=Drum Sol
DL=Drum Liq
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 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-33	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson — Telephone No.: 372-9658	Project Coordinator: KESSNER, JH	Price Code: 8B — Data Turnaround: 7 Days
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1 H2146 (7480)	SAF No.: B03-015	Air Quality ☐
Ice Chest No.: ERe 02 406	Field Logbook No.: EL-1578 — COA: C17HXB671C	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: A030 192	Bill of Lading/Air Bill No.: 7922 2458 5738	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To J00KW7

Special Handling and/or Storage
None

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			
Sample No.	Matrix *	Sample Date	Sample Time							
J00KX5	SOIL	4-3-03	1320	X	X	X	X	X	X	are 2" [illegible] - surface

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
[illegible] Bowers	4-3-03/1530	Ref 3C 3724	4-3-03/1530
3C 3728	4-8-03 1000	R. [illegible] R. [illegible]	4-8-03 1000
ERe R. [illegible] R. [illegible]	4-8-03 1000	Fed Ex	
Fed Ex		[illegible]	1000 - 4-8-03

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728
Ref # 3C on 4/8/03

Matrix *
S-Soil
SD-Sediment
SO-Solid
SL-Sludge
W - Water
O-Oil
A-Air
DS-Drum Sol
DL-Drum Liq
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

BHLEF.011 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-38	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson — Telephone No.: 372-9658	Project Coordinator: KESSNER, JH	Price Code: 8B — Data Turnaround: 7 Days
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1 H2146 (7480)	SAF No.: B03-015	Air Quality ☐
Ice Chest No.: ERC 02-406	Field Logbook No.: EL-1578 — COA: C17HXB671C	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: A030 192	Bill of Lading/Air Bill No.: 7922 2458 5738	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To J00KW7

Special Handling and/or Storage
None

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			

000030

Sample No.	Matrix *	Sample Date	Sample Time									
J00KY0	SOIL	4-2-03	1275	X	X	X	X	X		X	Trench 4c	
J00KX8	Soil	4-2-03	0850	X	X	X	X	X		X	Trench 4a	
J00KX9	Soil	4-2-03	1010	X	X	X	X	X		X	Trench 4b	
J00KX6	Soil	4-2-03	1340	X	X	X	X	X		X	Area 3 surface of pit	
J00KX7	Soil	4-2-03	1510	X	X	X	X	X		X	Area 3 sub-surface of	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Bowers	4-2-03 1615	RFJC 3728	4-2-03 1615
3C 3728	4-8-03 1000	R. Fahlberg	4-8-03 1000
ERC R. Fahlberg	4-8-03 1000	Fed Ex	
Fed Ex		1000	4-10-03

SPECIAL INSTRUCTIONS
(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/8/03

Matrix *: S=Soil, SD=Sediment, SO=Solid, Sl=Sludge, W=Water, O=Oil, A=Air, DS=Drum Solid, DL=Drum Liq, 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

RHLEF-011 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-39	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson; Telephone No.: 372-9658	Project Coordinator: KESSNER, JH	Price Code: 8B; Data Turnaround: 7 Days
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1 H2146 (7480)	SAF No.: B03-015	Air Quality ☐
Ice Chest No.: ERC 02-406	Field Logbook No.: EL-1578; COA: C17HXB671C	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: A030 192	Bill of Lading/Air Bill No.: 7922 2458 5738	

POSSIBLE SAMPLE HAZARDS/REMARKS: Radioactive Tie To 300 NW7

Special Handling and/or Storage: None

000031

Preservation	None	None	Cool 4C	Cool 4C								
Type of Container	aG	aG	aG	aG								
No. of Container(s)	1	1	1	1								
Volume	1000mL	60mL	120mL	60mL								
SAMPLE ANALYSIS	See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)								

Sample No.	Matrix *	Sample Date	Sample Time										
J00KY1	SOIL	4-2-03	0848	X	X	X	X						

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Ray Bowers Dennis	4-2-03/1645	Received By/Stored In: R of 3C 3728	4-2-03/1645
Relinquished By/Removed From: 3C 3728	4-8-03	1000	Received By/Stored In: R Fellows R Fellows	4-8-03 1000
Relinquished By/Removed From: ERC R Fellows R Fellows	4-8-03	1000	Received By/Stored In: Fed Ex	
Relinquished By/Removed From: Fed Ex			Received By/Stored In	4-9-03 1400
Relinquished By/Removed From			Received By/Stored In	
Relinquished By/Removed From			Received By/Stored In	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}
(2) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Do not use this sample for lab Q.C.

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/8/03

Matrix *: S=Soil, SE=Sediment, SO=Solid, SL=Sludge, W=Water, O=Oil, A=Air, DS=Drum Sol, DL=Drum Liq, 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 (03/01/2002)

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-B-1			DATA PACKAGE: H2146		
VALIDATOR: TTI		LAB: EB		DATE: 5/6/03	
CASE:			SDG: H2146		
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
J00KY0	J00KY1	J00KY8	J00KY9	J00KXC	J00KX7
J00KW9	J00KX2	J00KX3	J00KX4	J00KY0	J00KX1
J00KY5					
					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? ..... 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: K40 Ra 226/228 th 228/232
~ NU Cr A/B in FS

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

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

Comments:

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

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

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

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

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

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

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

Comments: _____

Appendix A – Radiochemical Data Validation Checklist

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: W9/X0

NO F3/PA3

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: 2G over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-015 **Method Blank**

METHOD BLANK

SDG	7480	Client/Case no	Hanford	SDG H2146	
Contact	Melissa C. Mannion	Contract	No. 630		
Lab sample id	R304055-15	Client sample id	Method Blank		
Dept sample id	7480-015	Material/Matrix		SOLID	
		SAF No	B03-015		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	-0.518	1.4	2.9	10	U	93A
Gross Beta	12587-47-2	-0.002	3.9	6.7	15	U	93B
Potassium 40	13966-00-2	U		0.30		U	GAM
Cobalt 60	10198-40-0	U		0.034	0.050	U	GAM
Cesium 137	10045-97-3	U		0.030	0.10	U	GAM
Radium 226	13982-63-3	U		0.056		U	GAM
Radium 228	15262-20-1	U		0.12		U	GAM
Europium 152	14683-23-9	U		0.063	0.10	U	GAM
Europium 154	15585-10-1	U		0.090	0.10	U	GAM
Europium 155	14391-16-3	U		0.064	0.10	U	GAM
Thorium 228	14274-82-9	U		0.042		U	GAM
Thorium 232	TH-232	U		0.12		U	GAM
Uranium 235	15117-96-1	U		0.091		U	GAM
Uranium 238	U-238	U		3.5		U	GAM
Americium 241	14596-10-2	U		0.091		U	GAM

Remaining Sites Confirmation Smpl.

QC-BLANK #44344

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-014

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7480
Contact Melissa C. Mannion

Client/Case no Hanford SDG H2146
Contract No. 630

Lab sample id R304055-14
Dept sample id 7480-014

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No B03-015

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	180	14	3.7	10		93A	190	7.6	95	69-131	70-130
Gross Beta	209	10	5.5	15		93B	211	8.4	99	76-124	70-130
Cobalt 60	4.96	0.22	0.080	0.050		GAM	5.08	0.20	98	76-124	80-120
Cesium 137	6.22	0.22	0.12	0.10		GAM	6.11	0.24	102	76-124	80-120

Remaining Sites Confirmation Smpl.

QC-LCS #44343

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 04/16/03

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2146

7480-016

J00KX2

DUPLICATE

SDG	7480			Client/Case no	Hanford SDG H2146
Contact	Melissa C. Mannion			Contract	No. 630
	DUPLICATE		ORIGINAL		
Lab sample id	R304055-16	Lab sample id	R304055-02	Client sample id	J00KX2
Dept sample id	7480-016	Dept sample id	7480-002	Location/Matrix	100-B-1 SOLID
		Received	04/09/03	Collected/Weight	04/03/03 10:41 1019 g
% solids	96.0	% solids	96.0	Custody/SAF No	B03-015-27 B03-015

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	4.34	3.3	3.9	10		93A	4.16	3.1	3.3		4	165	
Gross Beta	16.2	4.3	5.9	15		93B	15.6	4.2	5.5		4	65	
Potassium 40	12.7	0.67	0.29			GAM	13.1	0.77	0.38		3	34	
Cobalt 60	U		0.032	0.050	U	GAM	U		0.040	U	-		
Cesium 137	0.093	0.030	0.034	0.10		GAM	0.094	0.029	0.035		1	74	
Radium 226	0.611	0.068	0.060			GAM	0.569	0.070	0.068		7	40	
Radium 228	0.929	0.17	0.15			GAM	0.911	0.16	0.14		2	50	
Europium 152	U		0.073	0.10	U	GAM	U		0.081	U	-		
Europium 154	U		0.10	0.10	U	GAM	U		0.12	U	-		
Europium 155	U		0.10	0.10	U	GAM	U		0.12	U	-		
Thorium 228	0.710	0.038	0.036			GAM	0.760	0.047	0.046		7	34	
Thorium 232	0.929	0.17	0.15			GAM	0.911	0.16	0.14		2	50	
Uranium 235	U		0.14		U	GAM	U		0.16	U	-		
Uranium 238	U		3.5		U	GAM	U		4.3	U	-		
Americium 241	U		0.30		U	GAM	U		0.34	U	-		

Remaining Sites Confirmation Sampl.

QC-DUP#2 44345

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DUP
Version	3.06
Report date	04/16/03

Date: 12 May 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil -Waste Site 100-B-1
Subject: PCB/Pesticide - Data Package No. H2146-LLI (SDG No. H2146)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2146-LLI prepared by Lionville Laboratory Incorporated (LLI). A list of the 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
J00KY0	4/2/03	Soil	C	See note 1
J00KX8	4/2/03	Soil	C	See note 1
J00KX9	4/2/03	Soil	C	See note 1
J00KX6	4/2/03	Soil	C	See note 1
J00KX7	4/2/03	Soil	C	See note 1
J00KW9	4/3/03	Soil	C	See note 1
J00KX2	4/3/03	Soil	C	See note 1
J00KX3	4/3/03	Soil	C	See note 1
J00KX4	4/3/03	Soil	C	See note 1
J00KX0	4/3/03	Soil	C	See note 1
J00KX1	4/7/03	Soil	C	See note 1
J00KX5	4/3/03	Soil	C	See note 1

1 - PCBs by 8082; pesticides by 8081A.

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 December 2001) and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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

DATA QUALITY OBJECTIVES

- **Holding Times**

Sample data were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were acceptable.

- **Method Blank**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than required detection limit (RDL). If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than RDL, the result is qualified as undetected and elevated to the RDL.

All method blank target compound results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike

Matrix spike 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 analyses are performed in duplicate and must be within control limits of 70% to 130%. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Non-detected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Non-detected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Non-detected compounds with surrogate recoveries above the upper control limit require no qualification.

Due to surrogate interference, all PCB results in sample J00KY0 were qualified as estimates and flagged "J".

All other surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of plus/minus 30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates

and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicate samples J00KW9/J00KX0 were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Target Detection Limits TDLs to ensure that laboratory detection levels meet the required criteria. All reported PCB, toxaphene and methoxychlor results exceeded the TDL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data Package No. H2146-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 surrogate interference, all PCB results in sample J00KY0 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.

All reported PCB, toxaphene and methoxychlor results exceeded the TDL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incoroprated, March 2003.

DOE/RL-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein 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 quantitation limit is an estimate.

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: H2146	REVIEWER: TLI	DATE: 5/12/03	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
PCB	J	J00KY0	Surrogate interference

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																		
Laboratory: Lionville Laboratory Inc.																		
Case:	SDG: H2146																	
Sample Number		J00KY0		J00KX8		J00KX9		J00KX6		J00KX7		J00KW9		J00KX2		J00KX3		J00KX4
Remarks												Duplicate						
Sample Date		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/3/03		4/3/03		4/3/03		4/3/03
Extraction Date		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03
Analysis Date		4/15/03		4/15/03		4/15/03		4/15/03		4/15/03		4/16/03		4/16/03		4/16/03		4/16/03
PCB	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	16.5	36	UJ	35	U	35	U	35	U	35	U	35	U	35	U	36	U	35	U
Aroclor-1221	16.5	72	UJ	70	U	70	U	70	U	70	U	70	U	70	U	71	U	70	U
Aroclor-1232	16.5	36	UJ	35	U	35	U	35	U	35	U	35	U	35	U	36	U	35	U
Aroclor-1242	16.5	36	UJ	35	U	35	U	35	U	35	U	35	U	35	U	36	U	35	U
Aroclor-1248	16.5	36	UJ	35	U	35	U	35	U	35	U	35	U	35	U	36	U	35	U
Aroclor-1254	16.5	36	UJ	35	U	35	U	35	U	35	U	35	U	35	U	36	U	35	U
Aroclor-1260	16.5	36	UJ	35	U	35	U	35	U	35	U	35	U	35	U	36	U	35	U
Sample Number		J00KY0		J00KX8		J00KX9		J00KX6		J00KX7		J00KW9		J00KX2		J00KX3		J00KX4
Remarks												Duplicate						
Sample Date		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/3/03		4/3/03		4/3/03		4/3/03
Extraction Date		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03		4/9/03
Analysis Date		4/12/03		4/12/03		4/12/03		4/12/03		4/12/03		4/12/03		4/12/03		4/12/03		4/12/03
Pesticide	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U
Beta-BHC	5	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U
Delta-BHC	5	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U
Gamma-BHC (Lindan	5	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U
Heptachlor	5	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U
Aldrin	5	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U
Heptachlor Epoxide	5	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U
Endosulfan I	5	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U
Dieldrin	5	3.6	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.6	U	3.5	U
4,4'-DDE	5	3.6	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	22		3.6	U	3.5	U
Endrin	5	3.6	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.6	U	3.5	U
Endosulfan II	5	3.6	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.6	U	3.5	U
4,4'-DDD	5	3.6	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.6	U	3.5	U
Endosulfan Sulfate	5	3.6	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	8.4		3.6	U	3.5	U
4,4'-DDT	5	3.6	U	3.5	U	3.5		3.5	U	3.5	U	3.5	U	3.5	U	3.6	U	3.5	U
Methoxychlor	5	18	U	18	U	18	U	17	U	18	U	18	U	17	U	18	U	18	U
Endrin Ketone	5	3.6	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	6.6		3.6	U	3.5	U
Endrin Aldehyde	5	3.6	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.5	U	3.6	U	3.5	U
alpha-Chlordane	16.5	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U
gamma-Chlordane	16.5	1.8	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.8	U	1.8	U
Toxaphene	5	180	U	180	U	180	U	170	U	180	U	180	U	170	U	180	U	180	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.

PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																			
Laboratory: Lionville Laboratory Inc.																			
Case:	SDG: H2146																		
Sample Number		J00KX0		J00KX1		J00KX5													
Remarks																			
Sample Date		4/3/03		4/7/03		4/3/03													
Extraction Date		4/9/03		4/9/03		4/9/03													
Analysis Date		4/16/03		4/16/03		4/16/03													
PCB	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	16.5	35	U	35	U	36	U												
Aroclor-1221	16.5	70	U	71	U	71	U												
Aroclor-1232	16.5	35	U	35	U	36	U												
Aroclor-1242	16.5	35	U	35	U	36	U												
Aroclor-1248	16.5	35	U	35	U	36	U												
Aroclor-1254	16.5	35	U	35	U	36	U												
Aroclor-1260	16.5	35	U	35	U	36	U												
Sample Number		J00KX0		J00KX1		J00KX5													
Remarks																			
Sample Date		4/3/03		4/7/03		4/3/03													
Extraction Date		4/9/03		4/9/03		4/9/03													
Analysis Date		4/12/03		4/12/03		4/12/03													
Pesticide	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	1.7	U	1.8	U	1.8	U												
Beta-BHC	5	1.7	U	1.8	U	1.8	U												
Delta-BHC	5	1.7	U	1.8	U	1.8	U												
Gamma-BHC (Lindan	5	1.7	U	1.8	U	1.8	U												
Heptachlor	5	1.7	U	1.8	U	1.8	U												
Aldrin	5	1.7	U	1.8	U	1.8	U												
Heptachlor Epoxide	5	1.7	U	1.8	U	1.8	U												
Endosulfan I	5	1.7	U	1.8	U	1.8	U												
Dieldrin	5	3.5	U	3.5	U	3.6	U												
4,4'-DDE	5	3.5	U	3.5	U	3.6	U												
Endrin	5	3.5	U	3.5	U	3.6	U												
Endosulfan II	5	3.5	U	3.5	U	3.6	U												
4,4'-DDD	5	3.5	U	3.5	U	3.6	U												
Endosulfan Sulfate	5	3.5	U	3.5	U	3.6	U												
4,4'-DDT	5	3.5	U	3.5	U	3.6	U												
Methoxychlor	5	17	U	18	U	18	U												
Endrin Ketone	5	3.5	U	3.5	U	3.6	U												
Endrin Aldehyde	5	3.5	U	3.5	U	3.6	U												
alpha-Chlordane	16.5	1.7	U	1.8	U	1.8	U												
gamma-Chlordane	16.5	1.7	U	1.8	U	1.8	U												
Toxaphene	5	170	U	180	U	180	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.

PCBs by GC

Report Date: 04/17/03 11:15

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Page: 1

	Cust ID:	J00KY0	J00KX8	J00KX8	J00KX8	J00KX9	J00KX6
Sample Information	RFW#:	002	003	003 MS	003 MSD	004	005
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		I %	85 %	120 * %	115 %	90 %	95 %
Decachlorobiphenyl		120 %	105 %	130 * %	125 * %	100 %	105 %
Aroclor-1016		36 U J	35 U	124 %	122 %	35 U	35 U
Aroclor-1221		72 U	70 U	70 U	70 U	70 U	70 U
Aroclor-1232		36 U	35 U	35 U	35 U	35 U	35 U
Aroclor-1242		36 U	35 U	35 U	35 U	35 U	35 U
Aroclor-1248		36 U	35 U	35 U	35 U	35 U	35 U
Aroclor-1254		36 U	35 U	35 U	35 U	35 U	35 U
Aroclor-1260		36 U	35 U	133 %	131 %	35 U	35 U

	Cust ID:	J00KX7	J00KW9	J00KX2	J00KX3	J00KX4	J00KX0
Sample Information	RFW#:	006	007	008	009	010	011
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate: Tetrachloro-m-xylene		85 %	155 * %	100 %	110 %	115 %	95 %
Decachlorobiphenyl		100 %	145 * %	100 %	105 %	110 %	95 %
Aroclor-1016		35 U	35 U	35 U	36 U	35 U	35 U
Aroclor-1221		70 U	70 U	70 U	71 U	70 U	70 U
Aroclor-1232		35 U	35 U	35 U	36 U	35 U	35 U
Aroclor-1242		35 U	35 U	35 U	36 U	35 U	35 U
Aroclor-1248		35 U	35 U	35 U	36 U	35 U	35 U
Aroclor-1254		35 U	35 U	35 U	36 U	35 U	35 U
Aroclor-1260		35 U	35 U	35 U	36 U	35 U	35 U

000013

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 04/17/03 11:15

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Page: 2

	Cust ID:	J00KX1	J00KX5	PBLKQM	PBLKQM BS
Sample Information	RFW#:	012	013	03LE0414-MB1	03LE0414-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	85 %	85 %	90 %	125 * %
	Decachlorobiphenyl	90 %	90 %	115 %	130 * %
Aroclor-1016		35 U	36 U	33 U	131 %
Aroclor-1221		71 U	71 U	67 U	67 U
Aroclor-1232		35 U	36 U	33 U	33 U
Aroclor-1242		35 U	36 U	33 U	33 U
Aroclor-1248		35 U	36 U	33 U	33 U
Aroclor-1254		35 U	36 U	33 U	33 U
Aroclor-1260		35 U	36 U	33 U	126 %

000014

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 04/15/03 09:00

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Page: 1

	Cust ID:	J00KY0	J00KY0	J00KY0	J00KX8	J00KX9	J00KX6
Sample Information	RFW#:	002	002 MS	002 MSD	003	004	005
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	115 %	75 %	75 %	100 %	105 %	110 %
	Decachlorobiphenyl	170 * %	120 %	115 %	120 %	120 %	120 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.7 U
Beta-BHC		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.7 U
Delta-BHC		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.7 U
gamma-BHC (Lindane)		1.8 U	88 %	82 %	1.8 U	1.8 U	1.7 U
Heptachlor		1.8 U	94 %	90 %	1.8 U	1.8 U	1.7 U
Aldrin		1.8 U	78 %	76 %	1.8 U	1.8 U	1.7 U
Heptachlor epoxide		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.7 U
Endosulfan I		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.7 U
Dieldrin		3.6 U	100 %	97 %	3.5 U	3.5 U	3.5 U
4,4'-DDE		3.6 U	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U
Endrin		3.6 U	112 %	108 %	3.5 U	3.5 U	3.5 U
Endosulfan II		3.6 U	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U
4,4'-DDD		3.6 U	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U
Endosulfan sulfate		3.6 U	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U
4,4'-DDT		3.6 U	107 %	98 %	3.5 U	3.5 U	3.5 U
Methoxychlor		18 U	18 U	18 U	18 U	18 U	17 U
Endrin ketone		3.6 U	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U
Endrin aldehyde		3.6 U	3.6 U	3.6 U	3.5 U	3.5 U	3.5 U
alpha-Chlordane		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.7 U
gamma-Chlordane		1.8 U	1.8 U	1.8 U	1.8 U	1.8 U	1.7 U
Toxaphene		180 U	180 U	180 U	180 U	180 U	170 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

5/7/03

7Pgn 4/17/03

000015

Richville Laboratory, Inc.
Pesticide/PCBs by GC, CLP List

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Page: 2 Report Date: 04/15/03 09:00

9

	Cust ID:	J00KX7	J00KW9	J00KX2	J00KX3	J00KX4	J00KX0
Sample Information	RFW#:	006	007	008	009	010	011
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	110 %	85 %	60 %	115 %	115 %	60 %
	Decachlorobiphenyl	125 * %	90 %	100 %	135 * %	135 * %	75 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
Beta-BHC		1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
Delta-BHC		1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
gamma-BHC (Lindane)		1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
Heptachlor		1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
Aldrin		1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
Heptachlor epoxide		1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
Endosulfan I		1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
Dieldrin		3.5 U	3.5 U	3.5 U	3.6 U	3.5 U	3.5 U
4,4'-DDE		3.5 U	3.5 U	22	3.6 U	3.5 U	3.5 U
Endrin		3.5 U	3.5 U	3.5 U	3.6 U	3.5 U	3.5 U
Endosulfan II		3.5 U	3.5 U	3.5 U	3.6 U	3.5 U	3.5 U
4,4'-DDD		3.5 U	3.5 U	3.5 U	3.6 U	3.5 U	3.5 U
Endosulfan sulfate		3.5 U	3.5 U	8.4	3.6 U	3.5 U	3.5 U
4,4'-DDT		3.5 U	3.5 U	3.5 U	3.6 U	3.5 U	3.5 U
Methoxychlor		18 U	18 U	17 U	18 U	18 U	17 U
Endrin ketone		3.5 U	3.5 U	6.6	3.6 U	3.5 U	3.5 U
Endrin aldehyde		3.5 U	3.5 U	3.5 U	3.6 U	3.5 U	3.5 U
alpha-Chlordane		1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
gamma-Chlordane		1.8 U	1.8 U	1.7 U	1.8 U	1.8 U	1.7 U
Toxaphene		180 U	180 U	170 U	180 U	180 U	170 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

000016

5/5/03

4/17/03

Lionville Laboratory, Inc.

Pesticide/PCBs by GC, CLP List

Report Date: 04/15/03 09:00

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Page: 3

	Cust ID:	J00KX1	J00KX5	PBLKQM	PBLKQM BS
Sample Information	RFW#:	012	013	03LE0414-MB1	03LE0414-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	65 %	60 %	115 %	100 %
	Decachlorobiphenyl	95 %	70 %	160 * %	115 %
Alpha-BHC		1.8 U	1.8 U	1.7 U	1.7 U
Beta-BHC		1.8 U	1.8 U	1.7 U	1.7 U
Delta-BHC		1.8 U	1.8 U	1.7 U	1.7 U
gamma-BHC (Lindane)		1.8 U	1.8 U	1.7 U	58 %
Heptachlor		1.8 U	1.8 U	1.7 U	92 %
Aldrin		1.8 U	1.8 U	1.7 U	76 %
Heptachlor epoxide		1.8 U	1.8 U	1.7 U	1.7 U
Endosulfan I		1.8 U	1.8 U	1.7 U	1.7 U
Dieldrin		3.5 U	3.6 U	3.3 U	97 %
4,4'-DDE		3.5 U	3.6 U	3.3 U	3.3 U
Endrin		3.5 U	3.6 U	3.3 U	108 %
Endosulfan II		3.5 U	3.6 U	3.3 U	3.3 U
4,4'-DDD		3.5 U	3.6 U	3.3 U	3.3 U
Endosulfan sulfate		3.5 U	3.6 U	3.3 U	3.3 U
4,4'-DDT		3.5 U	3.6 U	3.3 U	49 %
Methoxychlor		18 U	18 U	17 U	17 U
Endrin ketone		3.5 U	3.6 U	3.3 U	3.3 U
Endrin aldehyde		3.5 U	3.6 U	3.3 U	3.3 U
alpha-Chlordane		1.8 U	1.8 U	1.7 U	1.7 U
gamma-Chlordane		1.8 U	1.8 U	1.7 U	1.7 U
Toxaphene		180 U	180 U	170 U	170 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

000017

5/7/03

PBlank

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015
LVL #: 0304L140
SDG/SAF #: H2146/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 04-09-03

PESTICIDE

The set of samples consisted of twelve (12) soil samples collected on 04-02,03,07-03.

The samples and their associated QC samples were extracted on 04-09-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 04-12-03. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8081A.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sarnple acceptance policy.

2. All required holding times for extraction and analysis have been met.

3. The method blank was below the reporting limits for all target compounds.

4. Five (5) of thirty-two (32) surrogate recoveries were outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).

6. All blank spike recoveries were within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

8. All initial calibrations associated with this data set were within acceptance criteria.

9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/17/03
Date

pef\r:\group\data\pest\tnu hanford\04L-140.pes

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 15 pages.

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015
LVL #: 0304L140
SDG/SAF #: H2146/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 04-09-03

PCB

The set of samples consisted of twelve (12) soil samples collected on 04-02,03,07-03.

The samples and their associated QC samples were extracted on 04-09-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 04-15,16-03. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

2. All required holding times for extraction and analysis have been met.

3. All samples and their associated QC samples received Sulfuric Acid and Sulfur cleanups.

4. The method blank was below the reporting limits for all target compounds.

5. Seven (7) of thirty-one (31) surrogate recoveries were outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).

6. All blank spike recoveries were within acceptance criteria.

7. All matrix spike recoveries were within acceptance criteria.

8. All initial calibrations associated with this data set were within acceptance criteria.

9. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria, with the exception of target compound Aroclor 1016 analyzed on 04-14-03 and 04-15-03 at 17:35 and 04:11, respectively, on the RTX-5 column. A copy of the Sample Discrepancy Report (SDR) has been enclosed.

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 17 pages.

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

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

4/17/03
Date

pe:f\r:\group\data\pest\tnu hanford\04L-140.pcb

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B03-015-38	Page 1 of 1
Collector: Fahlberg/Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH	Price Code: 8B
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1		SAF No.: B03-015	Air Quality ☐
Ice Chest No.: SEE OSPC	Field Logbook No.: EL-1578	COA: C17HXB671C	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: A030180		Bill of Lading/Air Bill No.: SEE OSPC	

Data Turnaround: 7 Days

POSSIBLE SAMPLE HAZARDS/REMARKS: Radioactive Tie To J00KW7

Special Handling and/or Storage: Cool 4°C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			

Sample No.	Matrix *	Sample Date	Sample Time									
J00KY0	SOIL	4-2-03	1275	X	X	X	X	X		X	Trench 4c	
J00KX8	Soil	4-2-03	0850	X	X	X	X	X		X	Trench 4a	
J00KX9	Soil	4-2-03	1010	X	X	X	X	X		X	Trench 4b	
J00KX6	Soil	4-2-03	1340	X	X	X	X	X		X	Area 3 surface of pit	
J00KX7	Soil	4-2-03	1510	X	X	X	X	X		X	Area 3 sub-surface of pit	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Tony Bowers Bowers	4-2-03 1615	RFRC 3728	4-2-03 1615
3C-3728	4-8-03 1000	RFRC Rfahlberg	4-8-03 1000
RFRC Rfahlberg	4-8-03 1000	Fed Ex	
Fed Ex	4/9/03 1010	[illegible]	4/9/03 1010
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/8/03

Matrix *: S=Soil, SD=Sediment, SO=Solid, SL=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

BHLEF.011 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-27	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1		SAF No.: B03-015
Ice Chest No.: SEE OSR	Field Logbook No.: EL-1578	COA: C17HXB671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: 0030180		Bill of Lading/Air Bill No.: SEE OSR

Price Code: 8B

Air Quality: ☐

Data Turnaround: 7 Days

POSSIBLE SAMPLE HAZARDS/REMARKS: Radioactive

Tie to 200 KW7

Special Handling and/or Storage: cool 4°C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions	See item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			

Sample No.	Matrix *	Sample Date	Sample Time								
J00KW9	SOIL	4-3-03	1215	X	X	X	X	X		X	Area 1 surface (pits)
J00KX2	Soil	4-3-03	1041	X	X	X	X	X		X	Area 2 surface (pits)
J00KX3	Soil	4-3-03	1059	X	X	X	X	X		X	bottom of trench 2C
J00KX4	Soil	4-3-03	0930	X	X	X	X	X		X	" " 2b
J00KX0	Soil	4-3-03	1215	X	X	X	X	X		X	Area 1 surface (pits)

J00KX0 0000220

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Gary Bowers Bowers	4-3-03/1530	RHF 3C	4-3-03/1530
3C 3728	4-8-03 1000	Rfahlberg	4-8-03 1000
ERC	1000	FedEx	
FedEx	4/9/03 1010		4-9-03 1010

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta; ~~Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90; Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)~~ AC 9/31/03

(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref# 3C on 4/8/03

Matrix *: S-Soil; SD-Sediment; SO-Solid; SL-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

RHLEF-011 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-29	Page 1 of 1
Director Fahlberg/Bowers	Company Contact Renee Nielson Telephone No. 372-9658	Project Coordinator KESSNER, JH	Price Code 8B Data Turnaround 7 Days Air Quality ☐
Project Destination Remaining Sites Confirmation Sampling-Soil	Sampling Location 100-B-1	SAF No. B03-015	
Ice Chest No. SEE OSR	Field Logbook No. EL-1578 COA C17HXB671C	Method of Shipment Federal Express	
Shipped To TMA/RECRA	Offsite Property No. A030180	Bill of Lading/Air Bill No. SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie TB J00KW7

Special Handling and/or Storage
Cool 4°C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions. 4-8-03	See item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL) 4-8-03	TPH (Total) - 418.1			

Sample No.	Matrix *	Sample Date	Sample Time									
J00KX1	SOIL	4-7-03	0841	X	X	X	X	X		X	area/sub-surface, pits	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From Doug Bowers Bowers 4-7-03	Date/Time 1040	Received By/Stored In Ref 3C 3728 4-7-03	Date/Time 1640
Relinquished By/Removed From 3C 3728 4-8-03	Date/Time 1000	Received By/Stored In R. Fahlberg R. Fahlberg 4-8-03	Date/Time 1000
Relinquished By/Removed From R. Fahlberg R. Fahlberg 4-8-03	Date/Time 1000	Received By/Stored In Fed Ex	Date/Time
Relinquished By/Removed From Fed Ex 4/9/03	Date/Time 1010	Received By/Stored In 4-9-03	Date/Time 1010
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/8/03

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=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

BHLEF-011 (03/01/2002)

000024

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		B03-015-33	Page 1 of 1
Collector: Fahlberg/Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH	Price Code: 8B
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1		SAF No.: B03-015	Air Quality ☐
Ice Chest No.: SEE GSPC	Field Logbook No.: EL-1578	COA: CI7HXB671C	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: R030 180		Bill of Lading/Air Bill No.: SEE GSPC	

Data Turnaround: 7 Days

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To J00KW7

Special Handling and/or Storage
Cool 4°C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See Item (1) in Special Instructions	See Item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			

Sample No.	Matrix *	Sample Date	Sample Time										
J00KX5	SOIL	4-3-03	1320	X	X	X	X	X		X	are	2"	90 - surface

000025

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Doug Bowers Bowers	4-3-03/1530	Ref 3C 3724	4-3-03/1530
3C 3728	4-8-03 1000	R. Fahlberg R. Fahlberg	4-8-03 1000
R. Fahlberg R. Fahlberg	4-8-03 1000	Fed Ex	
Fed Ex	4-9-03 1010	[illegible]	4-9-03 1010

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}; Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728
Ref # 3C on 4/8/03

Matrix *
S=Soil
SE=Sediment
SD=Solid
SL=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-FE-011 (03/01/2002)

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-B-1			DATA PACKAGE: H2145		
VALIDATOR: TLI		LAB: LLI		DATE: 5/6/03	
CASE:			SDG: H2146		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J00KY0	J00KX8	J00KX9	J00KX6	J00KX7	J00KW9
J00KX2	J00KX3	J00KX4	J00KX0	J00KX1	J00KX5
					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 acceptable? ..... Yes No N/A

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

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

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

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

DDT and endrin breakdowns acceptable? ..... Yes No N/A

Comments:

PESTICIDE/PCB DATA VALIDATION CHECKLIST

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

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

Surrogates analyzed? ..... Yes No N/A
Surrogate recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
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: No data
TOOKYO - Surrogate interfere - J

PESTICIDE/PCB 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. SYSTEM PERFORMANCE (Levels D and E)

Chromatographic performance acceptable? ..... Yes No N/A

Positive results resolved acceptably? ..... Yes No N/A

Comments:

7. HOLDING TIMES (all levels)

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

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

Comments:

PESTICIDE/PCB DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A

Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A

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: methoxyclor, toxaphene > our RDL
all PCBs

9. SAMPLE CLEANUP (Levels D and E)

Fluoricil ® (or other aborbant) cleanup performed? ..... Yes No N/A

Lot check performed? ..... Yes No N/A

Check recoveries aceptable? ..... Yes No N/A

GPC cleanup performed? ..... Yes No N/A

GPC check performed? ..... Yes No N/A

GPC check recoveries aceptable? ..... Yes No N/A

GPC calibration performed? ..... Yes No N/A

GPC calibration check performed? ..... Yes No N/A

GPC calibration check retention times acceptable? ..... Yes No N/A

Check/calibration materials traceable? ..... Yes No N/A

Check/calibration materials Expired? ..... Yes No N/A

Analytical batch QC given similar cleanup? ..... Yes No N/A

Transcription/Calculation Errors? ..... Yes No N/A

Comments:

Lionville Laboratory Sample Discrepancy Report (SDR) SDR #: 03 6C 112

Initiator: John Lach Batch: 03 04 L140 Parameter: OPO
Date: 4/10/03 Samples: 2-6, spike Matrix: Soil
Client: TAV Method: SW846/MCAWW/CLP/ Prep Batch: 03LE 0414

1. Reason for SDR

a. COC Discrepancy __ Tech Profile Error __ Client Request __ Sampler Error on C-O-C __ Transcription Error __ Wrong Test Code __ Other _____

b. General Discrepancy

__ Missing Sample/Extract* __ Container Broken __ Wrong Sample Pulled __ Label ID's Illegible
__ Hold Time Exceeded __ Insufficient Sample* __ Preservation Wrong __ Received Past Hold
__ Improper Bottle Type __ Not Amenable to Analysis

Note*: Verified by [Log-In] or [Prep Group] (circle)...signature/date: _____

c. Problem (Include all relevant specific results; attach data if necessary)

See attached.

2. Known or Probable Causes(s)

3. Discussion and Proposed Action Other Description:

__ Re-log
__ Entire Batch
__ Following Samples: _____
__ Re-leach
__ Re-extract
__ Re-digest
__ Revise EDD
__ Change Test Code to _____
__ Place On/Take Off Hold (circle)

Next.

4. Project Manager Instructions...signature/date: 4/16/03

__ Concur with Proposed Action
__ Disagree with Proposed Action; See Instruction
__ Include in Case Narrative
__ Client Contacted:
Date/Person _____
__ Add
__ Cancel

5. Final Action...signature/date: 4/17/03 Other Explanation:

__ Verified re-[log][leach][extract][digest][analysis] (circle)
__ Included in Case Narrative
__ Hard Copy COC Revised
__ Electronic COC Revised
__ EDD Corrections Completed

When Final Action has been recorded, forward original to QA Specialist for distribution and filing.

Route	Distribution of Completed SDR	Route	Distribution of Completed SDR
__	X Initiator	__	__ Metals: Beegle
__	X Lab General Manager: M. Taylor	__	__ Inorganic: Perrone
__	X Project Mgr: Stone/Johnson/Haslett	__	__ GC/LC: Kiger
__	X Technical Mgr: Wesson/Daniels	__	__ MS: Rychlak/Layman
__	X QA (file)	__	__ Log-in: Melnic
__	__ Data Management: Feldman	__	__ Admin: Soos
__	__ Sample Prep: Beegle/Kiger	__	__ Other: _____

QA-105-A-0801

Lionville Laboratory Sample Discrepancy Report (SDR) SDR# 03GC112

Initiator: John Lach	Batch: 0304L140	Parameter: OPCB
Date: 04/16/03	Samples: 2-6,7, SPIKES	Matrix: SOIL
Client: TNU-HANFORD	Method: 8082	Prep Batch: 03LE0414

The Continuing Calibration Check (CCV) run on 04/14/03 at 17:34 was decreased for Arochlor 1016 at –20.2% on the RTX-5 column. There are no hits in the samples.

The Continuing Calibration Check (CCV) run on 04/15/03 at 04:11 was decreased for Arochlor 1016 at –17.1.% on the RTX-5 column. There are no hits in the samples.

The matrix spike and blank spike surrogate recoveries are increased (see below). The Aroclor spikes are in control.

Sample #7 surrogate recoveries are increased. There are no hits in the sample

Upper Limit	118%	122%
Sample#	TCX	DCB
-003 MS	120%	130%
-MB1S	125%	130%
-007	155%	145%

C:\WINNT\Profiles\lachj\Personal\0304L140.doc

Date: 12 May 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site 100-B-1
Subject: Semivolatile - Data Package No. H2146-LLI (SDG No. H2146)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2146-LLI prepared by Lionville Laboratory Incorporated (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
J00KY1	4/2/03	Soil	C	See note 1
J00KY0	4/2/03	Soil	C	See note 1
J00KX8	4/2/03	Soil	C	See note 1
J00KX9	4/2/03	Soil	C	See note 1
J00KX6	4/2/03	Soil	C	See note 1
J00KX7	4/2/03	Soil	C	See note 1
J00KW9	4/3/03	Soil	C	See note 1
J00KX2	4/3/03	Soil	C	See note 1
J00KX3	4/3/03	Soil	C	See note 1
J00KX4	4/3/03	Soil	C	See note 1
J00KX0	4/3/03	Soil	C	See note 1
J00KX1	4/7/03	Soil	C	See note 1
J00KX5	4/3/03	Soil	C	See note 1

1-Semivolatiles by 8270C.

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 December 2001) and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Water samples must be extracted within 7 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

All holding times were met.

- **Method Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

Field Blanks

One equipment blank (J00KY1) was submitted for analysis. Di-n-butylphthalate and bis(2-ethylhexyl)phthalate were detected in the equipment blank. Under the BHI statement of work, no qualification is required. All other field blank results were acceptable.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate 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/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within a range of 50-150% or within laboratory control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

Due to the matrix spike and matrix spike duplicate not being prepared with the SDG, all results were qualified as estimates and flagged "J".

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the contract required quantitation limit (CRQL) are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike (MS)/matrix spike duplicate (MSD) results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. Samples results must be within RPD limits of +/-30%. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

Due to the matrix spike and matrix spike duplicate not being prepared with the SDG, all results were qualified as estimates and flagged "J".

Field Duplicate Samples

One set of field duplicate samples (J00KW9/J00KX0) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the target detection limits (TDL's) to ensure that laboratory detection levels meet the required criteria. Three hundred and twenty-eight sample results exceeded the TDL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2146-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 the matrix spike and matrix spike duplicate not being prepared with the SDG, all 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.

Three hundred and twenty-eight sample results exceeded the TDL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

DOE/RL-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the 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 same 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 quantitation limit is an estimate.

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 usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H2146	REVIEWER: TLI	DATE: 5/12/03	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	MS/MSD not prepared with the SDG

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ANALYSIS, WATER MATRIX, (UG/L)

Project: BECHTEL-HANFORD															
Laboratory: LLI															
Case:	SDG: H2146														
Sample Number		J00KY1		J00KY0		J00KX8		J00KX9		J00KX6		J00KX7		J00KW9	
Remarks		E. Blank													
Sample Date		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03	
Extraction Date		4/10/03		4/10/03		4/10/03		4/10/03		4/10/03		4/10/03		4/10/03	
Analysis Date		4/11/03		4/11/03		4/11/03		4/14/03		4/14/03		4/14/03		4/16/03	
Semivolatile (8270C)	TDL	Result	Q	Result	Q	Result	Q	Result	U	Result	Q	Result	Q	Result	Q
Phenol	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
bis(2-Chloroethyl)ether	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2-Chlorophenol	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
1,3-Dichlorobenzene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
1,4-Dichlorobenzene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
1,2-Dichlorobenzene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2-Methylphenol	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2,2'-oxybis(1-chloropropane)	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
3 and/or 4-Methylphenol	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
N-Nitroso-di-n-propylamine	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Hexachloroethane	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Nitrobenzene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Isophorone	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2-Nitrophenol	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2,4-Dimethylphenol	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
bis(2-Chloroethoxy)methane	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2,4-Dichlorophenol	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
1,2,4-Trichlorobenzene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Naphthalene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
4-Chloroaniline	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Hexachlorobutadiene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
4-Chloro-3-methylphenol	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2-Methylnaphthalene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Hexachlorocyclopentadiene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2,4,6-Trichlorophenol	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2,4,5-Trichlorophenol	660	840	UJ	900	UJ	880	UJ	880	UJ	870	UJ	880	UJ	18000	UJ
2-Chloronaphthalene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2-Nitroaniline	660	840	UJ	900	UJ	880	UJ	880	UJ	870	UJ	880	UJ	18000	UJ
Dimethylphthalate	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Acenaphthylene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2,6-Dinitrotoluene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	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.

SEMIVOLATILE ANALYSIS, WATER MATRIX, (UG/L)

Project: BECHTEL-HANFORD															
Laboratory: LLI															
Case:	SDG: H2136														
Sample Number		J00KY1		J00KY0		J00KX8		J00KX9		J00KX6		J00KX7		J00KW9	
Remarks		E. Blank													
Sample Date		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03	
Extraction Date		4/10/03		4/10/03		4/10/03		4/10/03		4/10/03		4/10/03		4/10/03	
Analysis Date		4/11/03		4/11/03		4/11/03		4/14/03		4/14/03		4/14/03		4/16/03	
Semivolatile (8270C)	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	660	840	UJ	900	UJ	880	UJ	880	UJ	870	UJ	880	UJ	7000	UJ
Acenaphthene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2,4-Dinitrophenol	660	840	UJ	900	UJ	880	UJ	880	UJ	870	UJ	880	UJ	18000	UJ
4-Nitrophenol	660	840	UJ	900	UJ	880	UJ	880	UJ	870	UJ	880	UJ	18000	UJ
Dibenzofuran	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
2,4-Dinitrotoluene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Diethylphthalate	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
4-Chlorophenyl-phenyl ether	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Fluorene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
4-Nitroaniline	660	840	UJ	900	UJ	880	UJ	880	UJ	870	UJ	880	UJ	18000	UJ
4,6-Dinitro-2-methylphenol	660	840	UJ	900	UJ	880	UJ	880	UJ	870	UJ	880	UJ	18000	UJ
N-Nitrosodiphenylamine	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
4-Bromophenyl-phenyl ether	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Hexachlorobenzene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Pentachlorophenol	660	840	UJ	900	UJ	880	UJ	880	UJ	870	UJ	880	UJ	18000	UJ
Phenanthrene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Anthracene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Carbazole	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Di-n-butylphthalate	660	71	J	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Fluoranthene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Pyrene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Butylbenzylphthalate	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
3,3'-Dichlorobenzidine	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Benzo(a)anthracene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Chrysene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
bis(2-Ethylhexyl)phthalate	660	220	J	360	UJ	350	UJ	350	UJ	100	J	350	UJ	7000	UJ
Di-n-octylphthalate	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Benzo(b)fluoranthene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Benzo(k)fluoranthene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Benzo(a)pyrene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Indeno(1,2,3-cd)pyrene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Dibenz(a,h)anthracene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	UJ
Benzo(g,h,i)perylene	660	330	UJ	360	UJ	350	UJ	350	UJ	350	UJ	350	UJ	7000	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.

SEMIVOLATILE ANALYSIS, WATER MATRIX, (UG/L)

Project: BECHTEL-HANFORD															
Laboratory: LLI															
Case:	SDG: H2146														
Sample Number		J00KX2		J00KX3		J00KX4		J00KX0		J00KX1		J00KX5			
Remarks								Duplicate							
Sample Date		4/2/03		4/3/03		4/3/03		4/3/03		4/7/03		4/3/03			
Extraction Date		4/10/03		4/10/03		4/10/03		4/10/03		4/10/03		4/10/03			
Analysis Date		4/16/03		4/14/03		4/15/03		4/15/03		4/15/03		4/15/03			
Semivolatile (8270C)	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
bis(2-Chloroethyl)ether	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2-Chlorophenol	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
1,3-Dichlorobenzene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
1,4-Dichlorobenzene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
1,2-Dichlorobenzene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2-Methylphenol	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2,2'-oxybis(1-chloropropane)	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
3 and/or 4-Methylphenol	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
N-Nitroso-di-n-propylamine	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Hexachloroethane	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Nitrobenzene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Isophorone	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2-Nitrophenol	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2,4-Dimethylphenol	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
bis(2-Chloroethoxy)methane	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2,4-Dichlorophenol	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
1,2,4-Trichlorobenzene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Naphthalene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
4-Chloroaniline	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Hexachlorobutadiene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
4-Chloro-3-methylphenol	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2-Methylnaphthalene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Hexachlorocyclopentadiene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2,4,6-Trichlorophenol	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2,4,5-Trichlorophenol	660	17000	UJ	890	UJ	880	UJ	8800	UJ	880	UJ	8900	UJ		
2-Chloronaphthalene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2-Nitroaniline	660	17000	UJ	890	UJ	880	UJ	8800	UJ	880	UJ	8900	UJ		
Dimethylphthalate	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Acenaphthylene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2,6-Dinitrotoluene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	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.

SEMIVOLATILE ANALYSIS, WATER MATRIX, (UG/L)

Project: BECHTEL-HANFORD
Laboratory: LLI
Case: SDG: H2146

Sample Number		J00KX2		J00KX3		J00KX4		J00KX0		J00KX1		J00KX5			
Remarks								Duplicate							
Sample Date		4/2/03		4/3/03		4/3/03		4/3/03		4/7/03		4/3/03			
Extraction Date		4/10/03		4/10/03		4/10/03		4/10/03		4/10/03		4/10/03			
Analysis Date		4/16/03		4/14/03		4/15/03		4/15/03		4/15/03		4/15/03			
Semivolatile (8270C)	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	660	17000	UJ	890	UJ	880	UJ	8800	UJ	880	UJ	8900	UJ		
Acenaphthene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2,4-Dinitrophenol	660	17000	UJ	890	UJ	880	UJ	8800	UJ	880	UJ	8900	UJ		
4-Nitrophenol	660	17000	UJ	890	UJ	880	UJ	8800	UJ	880	UJ	8900	UJ		
Dibenzofuran	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
2,4-Dinitrotoluene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Diethylphthalate	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
4-Chlorophenyl-phenyl ether	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Fluorene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
4-Nitroaniline	660	17000	UJ	890	UJ	880	UJ	8800	UJ	880	UJ	8900	UJ		
4,6-Dinitro-2-methylphenol	660	17000	UJ	890	UJ	880	UJ	8800	UJ	880	UJ	8900	UJ		
N-Nitrosodiphenylamine	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
4-Bromophenyl-phenyl ether	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Hexachlorobenzene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Pentachlorophenol	660	17000	UJ	890	UJ	880	UJ	8800	UJ	880	UJ	8900	UJ		
Phenanthrene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Anthracene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Carbazole	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Di-n-butylphthalate	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Fluoranthene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Pyrene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Butylbenzylphthalate	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
3,3'-Dichlorobenzidine	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Benzo(a)anthracene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Chrysene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
bis(2-Ethylhexyl)phthalate	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Di-n-octylphthalate	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Benzo(b)fluoranthene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Benzo(k)fluoranthene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Benzo(a)pyrene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Indeno(1,2,3-cd)pyrene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Dibenz(a,h)anthracene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	UJ		
Benzo(g,h,i)perylene	660	7000	UJ	360	UJ	350	UJ	3500	UJ	350	UJ	3600	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.

000015

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Report Date: 04/23/03 13:11 Page: 1a

	Cust ID:	J00KY1	J00KY0	J00KY0	J00KY0	J00KX8	J00KX9
Sample Information	RFW#:	001	002	002 MS	002 MSD	003	004
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	64 %	77 %	89 %	82 %	59 %	74 %
	2-Fluorobiphenyl	68 %	78 %	89 %	78 %	68 %	76 %
	Terphenyl-d14	77 %	94 %	114 %	111 %	90 %	102 %
	Phenol-d5	61 %	72 %	99 %	96 %	61 %	71 %
	2-Fluorophenol	62 %	77 %	92 %	88 %	59 %	74 %
	2,4,6-Tribromophenol	64 %	80 %	97 %	92 %	75 %	75 %
		fl	fl	fl	fl	fl	fl
Phenol		330 U J	360 U J	96 * %	97 * %	350 U J	350 U J
bis(2-Chloroethyl)ether		330 U	360 U	360 U	360 U	350 U	350 U
2-Chlorophenol		330 U	360 U	91 %	89 %	350 U	350 U
1,3-Dichlorobenzene		330 U	360 U	360 U	360 U	350 U	350 U
1,4-Dichlorobenzene		330 U	360 U	81 %	74 %	350 U	350 U
1,2-Dichlorobenzene		330 U	360 U	360 U	360 U	350 U	350 U
2-Methylphenol		330 U	360 U	360 U	360 U	350 U	350 U
2,2'-oxybis(1-Chloropropane)		330 U	360 U	360 U	360 U	350 U	350 U
3- and/or 4-Methylphenol		330 U	360 U	360 U	360 U	350 U	350 U
N-Nitroso-di-n-propylamine		330 U	360 U	90 %	81 %	350 U	350 U
Hexachloroethane		330 U	360 U	360 U	360 U	350 U	350 U
Nitrobenzene		330 U	360 U	360 U	360 U	350 U	350 U
Isophorone		330 U	360 U	360 U	360 U	350 U	350 U
2-Nitrophenol		330 U	360 U	360 U	360 U	350 U	350 U
2,4-Dimethylphenol		330 U	360 U	360 U	360 U	350 U	350 U
bis(2-Chloroethoxy)methane		330 U	360 U	360 U	360 U	350 U	350 U
2,4-Dichlorophenol		330 U	360 U	360 U	360 U	350 U	350 U
1,2,4-Trichlorobenzene		330 U	360 U	80 %	73 %	350 U	350 U
Naphthalene		330 U	360 U	360 U	360 U	350 U	350 U
4-Chloroaniline		330 U	360 U	360 U	360 U	350 U	350 U
Hexachlorobutadiene		330 U	360 U	360 U	360 U	350 U	350 U
4-Chloro-3-methylphenol		330 U	360 U	99 %	96 %	350 U	350 U
2-Methylnaphthalene		330 U	360 U	360 U	360 U	350 U	350 U
Hexachlorocyclopentadiene		330 U	360 U	360 U	360 U	350 U	350 U
2,4,6-Trichlorophenol		330 U	360 U	360 U	360 U	350 U	350 U
2,4,5-Trichlorophenol		840 U	900 U	900 U	900 U	880 U	880 U

*= Outside of EPA CLP QC limits.

Per 5/7/03

000016

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Page: 1b

Cust ID:	J00KY1	J00KY0	J00KY0	J00KY0	J00KX8	J00KX9
RFW#:	001	002	002 MS	002 MSD	003	004
2-Chloronaphthalene	330 U	360 U	360 U	360 U	350 U	350 U
2-Nitroaniline	840 U	900 U	900 U	900 U	880 U	880 U
Dimethylphthalate	330 U	360 U	360 U	360 U	350 U	350 U
Acenaphthylene	330 U	360 U	360 U	360 U	350 U	350 U
2,6-Dinitrotoluene	330 U	360 U	360 U	360 U	350 U	350 U
3-Nitroaniline	840 U	900 U	900 U	900 U	880 U	880 U
Acenaphthene	330 U	360 U	86 %	80 %	350 U	350 U
2,4-Dinitrophenol	840 U	900 U	900 U	900 U	880 U	880 U
4-Nitrophenol	840 U	900 U	94 %	93 %	880 U	880 U
Dibenzofuran	330 U	360 U	360 U	360 U	350 U	350 U
2,4-Dinitrotoluene	330 U	360 U	90 * %	86 %	350 U	350 U
Diethylphthalate	330 U	360 U	360 U	360 U	350 U	350 U
4-Chlorophenyl-phenylether	330 U	360 U	360 U	360 U	350 U	350 U
Fluorene	330 U	360 U	360 U	360 U	350 U	350 U
4-Nitroaniline	840 U	900 U	900 U	900 U	880 U	880 U
4,6-Dinitro-2-methylphenol	840 U	900 U	900 U	900 U	880 U	880 U
N-Nitrosodiphenylamine (1)	330 U	360 U	360 U	360 U	350 U	350 U
4-Bromophenyl-phenylether	330 U	360 U	360 U	360 U	350 U	350 U
Hexachlorobenzene	330 U	360 U	360 U	360 U	350 U	350 U
Pentachlorophenol	840 U	900 U	89 %	82 %	880 U	880 U
Phenanthrene	330 U	360 U	360 U	360 U	350 U	350 U
Anthracene	330 U	360 U	360 U	360 U	350 U	350 U
Carbazole	330 U	360 U	360 U	360 U	350 U	350 U
Di-n-butylphthalate	71 J	360 U	360 U	360 U	350 U	350 U
Fluoranthene	330 U	360 U	360 U	360 U	350 U	350 U
Pyrene	330 U	360 U	102 %	100 %	350 U	350 U
Butylbenzylphthalate	330 U	360 U	360 U	360 U	350 U	350 U
3,3'-Dichlorobenzidine	330 U	360 U	360 U	360 U	350 U	350 U
Benzo(a)anthracene	330 U	360 U	360 U	360 U	350 U	350 U
Chrysene	330 U	360 U	360 U	360 U	350 U	350 U
bis(2-Ethylhexyl)phthalate	220 J	360 U	360 U	19 J	350 U	350 U
Di-n-octyl phthalate	330 U	360 U	360 U	360 U	350 U	350 U
Benzo(b)fluoranthene	330 U	360 U	360 U	360 U	350 U	350 U
Benzo(k)fluoranthene	330 U	360 U	360 U	360 U	350 U	350 U
Benzo(a)pyrene	330 U	360 U	360 U	360 U	350 U	350 U
Indeno(1,2,3-cd)pyrene	330 U	360 U	360 U	360 U	350 U	350 U
Dibenz(a,h)anthracene	330 U	360 U	360 U	360 U	350 U	350 U
Benzo(g,h,i)perylene	330 U	360 U	360 U	360 U	350 U	350 U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

5/7/03

000017

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 04/23/03 13:11

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Page: 2a

	Cust ID:	J00KX6	J00KX7	J00KW9	J00KX2	J00KX3	J00KX4
Sample Information	RFW#:	005	006	007	008	009	010
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	20.0	20.0	1.00	1.00
	Units:	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg
Surrogate Recovery	Nitrobenzene-d5	81 %	76 %	62 %	61 %	66 %	67 %
	2-Fluorobiphenyl	84 %	78 %	66 %	59 %	78 %	77 %
	Terphenyl-d14	108 %	104 %	228 * %	234 * %	85 %	97 %
	Phenol-d5	77 %	73 %	58 %	56 %	58 %	52 %
	2-Fluorophenol	81 %	77 %	67 %	65 %	73 %	75 %
	2,4,6-Tribromophenol	84 %	75 %	69 %	46 %	50 %	26 %
		fl	fl	fl	fl	fl	fl
Phenol		350 U J	350 U J	7000 U J	7000 U J	360 U J	350 U J
bis(2-Chloroethyl)ether		350 U	350 U	7000 U	7000 U	360 U	350 U
2-Chlorophenol		350 U	350 U	7000 U	7000 U	360 U	350 U
1,3-Dichlorobenzene		350 U	350 U	7000 U	7000 U	360 U	350 U
1,4-Dichlorobenzene		350 U	350 U	7000 U	7000 U	360 U	350 U
1,2-Dichlorobenzene		350 U	350 U	7000 U	7000 U	360 U	350 U
2-Methylphenol		350 U	350 U	7000 U	7000 U	360 U	350 U
2,2'-oxybis(1-Chloropropane)		350 U	350 U	7000 U	7000 U	360 U	350 U
3- and/or 4-Methylphenol		350 U	350 U	7000 U	7000 U	360 U	350 U
N-Nitroso-di-n-propylamine		350 U	350 U	7000 U	7000 U	360 U	350 U
Hexachloroethane		350 U	350 U	7000 U	7000 U	360 U	350 U
Nitrobenzene		350 U	350 U	7000 U	7000 U	360 U	350 U
Isophorone		350 U	350 U	7000 U	7000 U	360 U	350 U
2-Nitrophenol		350 U	350 U	7000 U	7000 U	360 U	350 U
2,4-Dimethylphenol		350 U	350 U	7000 U	7000 U	360 U	350 U
bis(2-Chloroethoxy)methane		350 U	350 U	7000 U	7000 U	360 U	350 U
2,4-Dichlorophenol		350 U	350 U	7000 U	7000 U	360 U	350 U
1,2,4-Trichlorobenzene		350 U	350 U	7000 U	7000 U	360 U	350 U
Naphthalene		350 U	350 U	7000 U	7000 U	360 U	350 U
4-Chloroaniline		350 U	350 U	7000 U	7000 U	360 U	350 U
Hexachlorobutadiene		350 U	350 U	7000 U	7000 U	360 U	350 U
4-Chloro-3-methylphenol		350 U	350 U	7000 U	7000 U	360 U	350 U
2-Methylnaphthalene		350 U	350 U	7000 U	7000 U	360 U	350 U
Hexachlorocyclopentadiene		350 U	350 U	7000 U	7000 U	360 U	350 U
2,4,6-Trichlorophenol		350 U	350 U	7000 U	7000 U	360 U	350 U
2,4,5-Trichlorophenol		870 U	880 U	18000 U	17000 U	890 U	880 U

*= Outside of EPA CLP QC limits.

5/7/03

000018

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Page: 2b

Cust ID:	J00KX6			J00KX7			J00KW9			J00KX2			J00KX3			J00KX4		
RFW#:	005			006			007			008			009			010		
2-Chloronaphthalene	350	U	J	350	U	J	7000	U	J	7000	U	J	360	U	J	350	U	J
2-Nitroaniline	870	U		880	U		18000	U		17000	U		890	U		880	U	
Dimethylphthalate	350	U		350	U		7000	U		7000	U		360	U		350	U	
Acenaphthylene	350	U		350	U		7000	U		7000	U		360	U		350	U	
2,6-Dinitrotoluene	350	U		350	U		7000	U		7000	U		360	U		350	U	
3-Nitroaniline	870	U		880	U		18000	U		17000	U		890	U		880	U	
Acenaphthene	350	U		350	U		7000	U		7000	U		360	U		350	U	
2,4-Dinitrophenol	870	U		880	U		18000	U		17000	U		890	U		880	U	
4-Nitrophenol	870	U		880	U		18000	U		17000	U		890	U		880	U	
Dibenzofuran	350	U		350	U		7000	U		7000	U		360	U		350	U	
2,4-Dinitrotoluene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Diethylphthalate	350	U		350	U		7000	U		7000	U		360	U		350	U	
4-Chlorophenyl-phenylether	350	U		350	U		7000	U		7000	U		360	U		350	U	
Fluorene	350	U		350	U		7000	U		7000	U		360	U		350	U	
4-Nitroaniline	870	U		880	U		18000	U		17000	U		890	U		880	U	
4,6-Dinitro-2-methylphenol	870	U		880	U		18000	U		17000	U		890	U		880	U	
N-Nitrosodiphenylamine (1)	350	U		350	U		7000	U		7000	U		360	U		350	U	
4-Bromophenyl-phenylether	350	U		350	U		7000	U		7000	U		360	U		350	U	
Hexachlorobenzene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Pentachlorophenol	870	U		880	U		18000	U		17000	U		890	U		880	U	
Phenanthrene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Anthracene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Carbazole	350	U		350	U		7000	U		7000	U		360	U		350	U	
Di-n-butylphthalate	350	U		350	U		7000	U		7000	U		360	U		350	U	
Fluoranthene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Pyrene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Butylbenzylphthalate	350	U		350	U		7000	U		7000	U		360	U		350	U	
3,3'-Dichlorobenzidine	350	U		350	U		7000	U		7000	U		360	U		350	U	
Benzo(a)anthracene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Chrysene	350	U		350	U		7000	U		7000	U		360	U		350	U	
bis(2-Ethylhexyl)phthalate	100	J		350	U		7000	U		7000	U		360	U		350	U	
Di-n-octyl phthalate	350	U		350	U		7000	U		7000	U		360	U		350	U	
Benzo(b)fluoranthene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Benzo(k)fluoranthene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Benzo(a)pyrene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Indeno(1,2,3-cd)pyrene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Dibenz(a,h)anthracene	350	U		350	U		7000	U		7000	U		360	U		350	U	
Benzo(g,h,i)perylene	350	U		350	U		7000	U		7000	U		360	U		350	U	

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

5/19/05

000019

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Report Date: 04/23/03 13:11 Page: 3a

	Cust ID:	J00KX0		J00KX1		J00KX5		SBLKRC		SBLKRC BS		SBLKRN	
Sample Information	RFW#:	011		012		013		03LE0415-MB1		03LE0415-MB1		03LE0454-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	10.0		1.00		10.0		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	65	%	69	%	43	%	41	%	62	%	92	%
	2-Fluorobiphenyl	89	%	86	%	70	%	44	%	67	%	88	%
	Terphenyl-d14	74	%	83	%	71	%	63	%	79	%	110	%
	Phenol-d5	68	%	71	%	46	%	40	%	63	%	101	%
	2-Fluorophenol	75	%	75	%	51	%	42	%	63	%	95	%
	2,4,6-Tribromophenol	81	%	85	%	77	%	51	%	75	%	88	%
			fl		fl		fl		fl		fl		fl
Phenol		3500	U	350	U	3600	U	330	U	57	%	330	U
bis(2-Chloroethyl)ether		3500	U	350	U	3600	U	330	U	330	U	330	U
2-Chlorophenol		3500	U	350	U	3600	U	330	U	57	%	330	U
1,3-Dichlorobenzene		3500	U	350	U	3600	U	330	U	330	U	330	U
1,4-Dichlorobenzene		3500	U	350	U	3600	U	330	U	55	%	330	U
1,2-Dichlorobenzene		3500	U	350	U	3600	U	330	U	330	U	330	U
2-Methylphenol		3500	U	350	U	3600	U	330	U	330	U	330	U
2,2'-oxybis(1-Chloropropane)		3500	U	350	U	3600	U	330	U	330	U	330	U
3- and/or 4-Methylphenol		3500	U	350	U	3600	U	330	U	330	U	330	U
N-Nitroso-di-n-propylamine		3500	U	350	U	3600	U	330	U	53	%	330	U
Hexachloroethane		3500	U	350	U	3600	U	330	U	330	U	330	U
Nitrobenzene		3500	U	350	U	3600	U	330	U	330	U	330	U
Isophorone		3500	U	350	U	3600	U	330	U	330	U	330	U
2-Nitrophenol		3500	U	350	U	3600	U	330	U	330	U	330	U
2,4-Dimethylphenol		3500	U	350	U	3600	U	330	U	330	U	330	U
bis(2-Chloroethoxy)methane		3500	U	350	U	3600	U	330	U	330	U	330	U
2,4-Dichlorophenol		3500	U	350	U	3600	U	330	U	330	U	330	U
1,2,4-Trichlorobenzene		3500	U	350	U	3600	U	330	U	57	%	330	U
Naphthalene		3500	U	350	U	3600	U	330	U	330	U	330	U
4-Chloroaniline		3500	U	350	U	3600	U	330	U	330	U	330	U
Hexachlorobutadiene		3500	U	350	U	3600	U	330	U	330	U	330	U
4-Chloro-3-methylphenol		3500	U	350	U	3600	U	330	U	58	%	330	U
2-Methylnaphthalene		3500	U	350	U	3600	U	330	U	330	U	330	U
Hexachlorocyclopentadiene		3500	U	350	U	3600	U	330	U	330	U	330	U
2,4,6-Trichlorophenol		3500	U	350	U	3600	U	330	U	330	U	330	U
2,4,5-Trichlorophenol		8800	U	880	U	8900	U	840	U	840	U	840	U

*= Outside of EPA CLP QC limits.

000020

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Page: 3b

Cust ID:	J00KX0		J00KX1		J00KX5		SBLKRC		SBLKRC BS		SBLKRN	
RFW#:	011		012		013		03LE0415-MB1		03LE0415-MB1		03LE0454-MB1	
2-Chloronaphthalene	3500	U	350	U	3600	U	330	U	330	U	330	U
2-Nitroaniline	8800	U	880	U	8900	U	840	U	840	U	840	U
Dimethylphthalate	3500	U	350	U	3600	U	330	U	330	U	330	U
Acenaphthylene	3500	U	350	U	3600	U	330	U	330	U	330	U
2,6-Dinitrotoluene	3500	U	350	U	3600	U	330	U	330	U	330	U
3-Nitroaniline	8800	U	880	U	8900	U	840	U	840	U	840	U
Acenaphthene	3500	U	350	U	3600	U	330	U	59	%	330	U
2,4-Dinitrophenol	8800	U	880	U	8900	U	840	U	840	U	840	U
4-Nitrophenol	8800	U	880	U	8900	U	840	U	69	%	840	U
Dibenzofuran	3500	U	350	U	3600	U	330	U	330	U	330	U
2,4-Dinitrotoluene	3500	U	350	U	3600	U	330	U	71	%	330	U
Diethylphthalate	3500	U	350	U	3600	U	330	U	330	U	330	U
4-Chlorophenyl-phenylether	3500	U	350	U	3600	U	330	U	330	U	330	U
Fluorene	3500	U	350	U	3600	U	330	U	330	U	330	U
4-Nitroaniline	8800	U	880	U	8900	U	840	U	840	U	840	U
4,6-Dinitro-2-methylphenol	8800	U	880	U	8900	U	840	U	840	U	840	U
N-Nitrosodiphenylamine (1)	3500	U	350	U	3600	U	330	U	330	U	330	U
4-Bromophenyl-phenylether	3500	U	350	U	3600	U	330	U	330	U	330	U
Hexachlorobenzene	3500	U	350	U	3600	U	330	U	330	U	330	U
Pentachlorophenol	8800	U	880	U	8900	U	840	U	77	%	840	U
Phenanthrene	3500	U	350	U	3600	U	330	U	330	U	330	U
Anthracene	3500	U	350	U	3600	U	330	U	330	U	330	U
Carbazole	3500	U	350	U	3600	U	330	U	330	U	330	U
Di-n-butylphthalate	3500	U	350	U	3600	U	330	U	330	U	330	U
Fluoranthene	3500	U	350	U	3600	U	330	U	330	U	330	U
Pyrene	3500	U	350	U	3600	U	330	U	69	%	330	U
Butylbenzylphthalate	3500	U	350	U	3600	U	330	U	330	U	330	U
3,3'-Dichlorobenzidine	3500	U	350	U	3600	U	330	U	330	U	330	U
Benzo(a)anthracene	3500	U	350	U	3600	U	330	U	330	U	330	U
Chrysene	3500	U	350	U	3600	U	330	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	3500	U	350	U	3600	U	330	U	330	U	330	U
Di-n-octyl phthalate	3500	U	350	U	3600	U	330	U	330	U	330	U
Benzo(b)fluoranthene	3500	U	350	U	3600	U	330	U	330	U	330	U
Benzo(k)fluoranthene	3500	U	350	U	3600	U	330	U	330	U	330	U
Benzo(a)pyrene	3500	U	350	U	3600	U	330	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	3500	U	350	U	3600	U	330	U	330	U	330	U
Dibenz(a,h)anthracene	3500	U	350	U	3600	U	330	U	330	U	330	U
Benzo(g,h,i)perylene	3500	U	350	U	3600	U	330	U	330	U	330	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

000021

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 0304L140 Client: TNUHANFORD B03-015 H2146 Work Order: 11343606001 Report Date: 04/23/03 13:11 Page: 4a

Cust ID: **SBLKRN BS**

Sample Information	RFW#:	03LE0454-MB1
	Matrix:	SOIL
	D.F.:	1.00
	Units:	ug/Kg

Surrogate Recovery	Nitrobenzene-d5	73	%
	2-Fluorobiphenyl	77	%
	Terphenyl-d14	97	%
	Phenol-d5	78	%
	2-Fluorophenol	70	%
	2,4,6-Tribromophenol	85	%

Phenol	75	%
bis(2-Chloroethyl)ether	330	U
2-Chlorophenol	72	%
1,3-Dichlorobenzene	330	U
1,4-Dichlorobenzene	65	%
1,2-Dichlorobenzene	330	U
2-Methylphenol	330	U
2,2'-oxybis(1-Chloropropane)	330	U
3- and/or 4-Methylphenol	330	U
N-Nitroso-di-n-propylamine	73	%
Hexachloroethane	330	U
Nitrobenzene	330	U
Isophorone	330	U
2-Nitrophenol	330	U
2,4-Dimethylphenol	330	U
bis(2-Chloroethoxy)methane	330	U
2,4-Dichlorophenol	330	U
1,2,4-Trichlorobenzene	67	%
Naphthalene	330	U
4-Chloroaniline	330	U
Hexachlorobutadiene	330	U
4-Chloro-3-methylphenol	87	%
2-Methylnaphthalene	330	U
Hexachlorocyclopentadiene	330	U
2,4,6-Trichlorophenol	330	U
2,4,5-Trichlorophenol	840	U

*= Outside of EPA CLP QC limits.

000022

Cust ID: **SBLKRW BS**

RFW#: **03LE0454-MB1**

2-Chloronaphthalene	330	U
2-Nitroaniline	840	U
Dimethylphthalate	330	U
Acenaphthylene	330	U
2,6-Dinitrotoluene	330	U
3-Nitroaniline	840	U
Acenaphthene	77	%
2,4-Dinitrophenol	840	U
4-Nitrophenol	91	%
Dibenzofuran	330	U
2,4-Dinitrotoluene	85	%
Diethylphthalate	330	U
4-Chlorophenyl-phenylether	330	U
Fluorene	330	U
4-Nitroaniline	840	U
4,6-Dinitro-2-methylphenol	840	U
N-Nitrosodiphenylamine (1)	330	U
4-Bromophenyl-phenylether	330	U
Hexachlorobenzene	330	U
Pentachlorophenol	83	%
Phenanthrene	330	U
Anthracene	330	U
Carbazole	330	U
Di-n-butylphthalate	330	U
Fluoranthene	330	U
Pyrene	88	%
Butylbenzylphthalate	330	U
3,3'-Dichlorobenzidine	330	U
Benzo(a)anthracene	330	U
Chrysene	330	U
bis(2-Ethylhexyl)phthalate	170	J
Di-n-octyl phthalate	330	U
Benzo(b)fluoranthene	330	U
Benzo(k)fluoranthene	330	U
Benzo(a)pyrene	330	U
Indeno(1,2,3-cd)pyrene	330	U
Dibenz(a,h)anthracene	330	U
Benzo(g,h,i)perylene	330	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

000023

911

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Client: TNU-HANFORD B03-015
LVL #: 0304L140
SDG/SAF # H2146/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 04-09-2003

SEMIVOLATILE

Thirteen (13) soil samples were collected on 04-02,03,07-2003.

The samples and their associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 04-10-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL Semivolatile target compounds on 04-11,14,15,16-2003.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. Samples J00KW9, J00KX2, J00KX5 and J00KX0 required 10 to 20-fold dilutions due to the nature of the sample matrix.
5. Two (2) of one hundred two (102) surrogate recoveries were outside EPA QC limits. However, EPA CLP surrogate recovery criteria were met (i.e., no more than one outlier per fraction {acid and base neutral} and no recoveries less than 10%).
6. All matrix spike recoveries were within EPA QC limits.
7. All blank spike recoveries were within EPA QC limits.
8. Internal standard area criteria were not met for several samples; however, the GC/MS instrument was inspected for possible malfunction and was judged to be functioning properly.
9. Manual integrations are performed according to OP 21-06A-125 to produce quality data with the utmost integrity. All manual integrations are required to be technically valid and properly documented. Appropriate technical flags are defined in the Glossary ("Technical Flags For Manual Integration").
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

J. Michael Taylor
President
Lionville Laboratory Incorporated

04-17-03
Date

000025

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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 ~~3/3~~ 35 pages. 4/23/03

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-39	Page 1 of 1

ollector Fahlberg/Bowers	Company Contact Renee Nielson	Telephone No. 372-9658	Project Coordinator KESSNER, JH
roject Designation Remaining Sites Confirmation Sampling-Soil	Sampling Location 100-B-1		SAF No. B03-015
ce Chest No. SEE OSR	Field Logbook No. EL-1578	COA C17HXB671C	Method of Shipment Federal Express
Shipped To TMA/RECRA	Offsite Property No. B030 180		Bill of Lading/Air Bill No. SEE OSR

Price Code 8B

Air Quality ☐

Data Turnaround 7 Days

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive Tie To J00KW7

Special Handling and/or Storage
Cool 4°C

Preservation	None	None	Cool 4C	Cool 4C								
Type of Container	aG	aG	aG	aG								
No. of Container(s)	1	1	1	1								
Volume	1000mL	60mL	120mL	60mL								
SAMPLE ANALYSIS	See item (1) in Special Instructions	See item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)								
Sample No.	Matrix *	Sample Date	Sample Time									
J00KY1	SOIL	4-2-03	0848	X	X	X	X					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Fahlberg/Bowers	4-2-03/1645	R.F. 3C 3728	4-2-03/1645
3C 3728	4-8-03 1000	R.Fahlberg R.Fahlberg	4-8-03 1000
R.Fahlberg R.Fahlberg	4-8-03 1000	Fed Ex	
Fed Ex	4/9/03 1010	[illegible]	4/9/03 1010
Fed Ex	4-9-03 1010	[illegible]	4/9/03 1010
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Do not use this sample for lab QC

Personnel not available to relinquish samples from the 3728
Ref # 3C on 4/8/03

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=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 (03/01/2002)

000026

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-38	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1	SAF No.: B03-015	
Ice Chest No.: SEE OSPC	Field Logbook No.: EL-1578	COA: C17HXB671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030180		Bill of Lading/Air Bill No.: SEE OSPC

POSSIBLE SAMPLE HAZARDS/REMARKS: Radioactive Tie To J00KW7

Special Handling and/or Storage: Cool 4°C

020027

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions.	See item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			

Sample No.	Matrix *	Sample Date	Sample Time									
J00KY0	SOIL	4-2-03	1275	X	X	X	X	X		X	Trench 4c	
J00KX8	Soil	4-2-03	0850	X	X	X	X	X		X	Trench 4a	
J00KX9	Soil	4-2-03	1010	X	X	X	X	X		X	Trench 4b	
J00KX6	Soil	4-2-03	1340	X	X	X	X	X		X	Area 3 surface of pits	
J00KX7	Soil	4-2-03	1510	X	X	X	X	X		X	Area 3 sub-surface of pits	

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: Doug Bowers Bowers 4-2-03	Date/Time: 1615	Received By/Stored In: R.F.C 3728 4-2-03
Date/Time: 1615		
Relinquished By/Removed From: 3C 3728 4-8-03	Date/Time: 1000	Received By/Stored In: R.Fallen R.Fallen 4-8-03
Date/Time: 1000		
Relinquished By/Removed From: FRC R.Fallen R.Fallen 4-8-03	Date/Time: 1000	Received By/Stored In: Fed Ex
Date/Time:		
Relinquished By/Removed From: Fed Ex 4/9/03	Date/Time: 1010	Received By/Stored In: 4-9-03
Date/Time: 1010		
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:
Date/Time:		
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:
Date/Time:		

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/8/03

Matrix *: S=Soil; SE=Sediment; SO=Solid; SL=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 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-27	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson; Telephone No.: 372-9658	Project Coordinator: KESSNER, JH	Price Code: 8B; Air Quality ☐	Data Turnaround: 7 Days
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1	SAF No.: B03-015		
Cooler Chest No.: SEE OSR	Field Logbook No.: EL-1578	COA: C17HXB671C	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: 0030180		Bill of Lading/Air Bill No.: SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS: Radioactive; Tie to J00KW7

Special Handling and/or Storage: Cool 4°C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions	See item (2) in Special Instructions	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			

Sample No.	Matrix *	Sample Date	Sample Time									
J00KW9	SOIL	4-3-03	1215	X	X	X	X	X		X	Area 1 surface (pits)	
J00KX2	Soil	4-3-03	1041	X	X	X	X	X		X	Area 2 surface (pits)	
J00KX3	Soil	4-3-03	1058	X	X	X	X	X		X	bottom of trench 2C	
J00KX4	Soil	4-3-03	0930	X	X	X	X	X		X	" " 2b	
J00KX0	Soil	4-3-03	1215	X	X	X	X	X		X	Area 1 surface (pits)	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Doug Bowers Bowers 4-3-03	Date/Time: 1530	Received By/Stored In: DHF 3C 4-3-03	Date/Time: 1530
Relinquished By/Removed From: 3C 3728 4-8-03	Date/Time: 1000	Received By/Stored In: R.E. Fahlberg 4-8-03	Date/Time: 1000
Relinquished By/Removed From: ERC R.E. Fahlberg 4-8-03	Date/Time: 1000	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: Fed Ex 4/9/03	Date/Time: 1010	Received By/Stored In: 4-9-03	Date/Time: 1010
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta; ~~Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89/90; Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)~~ AC 3/31/03

(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/8/03

Matrix *: S=Soil; SE=Sediment; SO=Solid; SL=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

000028

BUI EE.011 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-29	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1	SAF No.: B03-015	
Ice Chest No.: SEE OSPC	Field Logbook No.: EL-1578	COA: C17HXB671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030180	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
TiCTS 700 KW7

Special Handling and/or Storage
Cool 4°C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	aG	aG	aG	aG	aG	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions. 4-8-03	See item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL) 4-8-03	TPH (Total) - 418.1			

620000

Sample No.	Matrix *	Sample Date	Sample Time										
J00KX1	SOIL	4-7-03	0841	X	X	X	X	X		X	area/sub-surface, pits		

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: Doug Bowers Bowers 4-7-03	Date/Time: 1040	Received By/Stored In: A of 3C 3728 4-7-03
Relinquished By/Removed From: 3C 3728 4-8-03	Date/Time: 1000	Received By/Stored In: R. Fahlberg R Fahlberg 4-8-03
Relinquished By/Removed From: R Fahlberg R Fahlberg 4-8-03	Date/Time: 1000	Received By/Stored In: Fed Ex
Relinquished By/Removed From: Fed Ex 4-9-03	Date/Time: 1010	Received By/Stored In: 4-9-03
Relinquished By/Removed From	Date/Time	Received By/Stored In
Relinquished By/Removed From	Date/Time	Received By/Stored In

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/8/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
SL=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 (03/01/2002)

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-33	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1	SAF No.: B03-015	
Ice Chest No.: SEE OSPC	Field Logbook No.: EL-1578	COA: C17HXB671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: R030 180	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To J00KW7

Special Handling and/or Storage
Cool 4°C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions	See item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			

000030

Sample No.	Matrix *	Sample Date	Sample Time										
J00KX5	SOIL	4-3-03	1320	X	X	X	X	X		X	area	2" sub-surface	

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By/Removed From: Doug Bowers Bowers 4-3-03/1430	Received By/Stored In: Ref 3C 3729 4-3-03/1430	Date/Time
Relinquished By/Removed From: 3C 3728 4-8-03 1000	Received By/Stored In: R. Fahlberg R. Fahlberg 4-8-03	Date/Time 1000
Relinquished By/Removed From: ERe R. Fahlberg R. Fahlberg 4-8-03	Received By/Stored In: Fed Ex	Date/Time
Relinquished By/Removed From: Fed Ex 4-9-03 1010	Received By/Stored In: 4-9-03 1010	Date/Time
Relinquished By/Removed From	Received By/Stored In	Date/Time
Relinquished By/Removed From	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/8/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=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

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

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:			DATA PACKAGE: H2146		
VALIDATOR:		LAB: LJ		DATE: 5/6/03	
CASE:			SDG: H2146		
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J00KY1	J00KY0	J00KX8	J00KX9	J00KX6	
J00KX7	J00KW9	J00KX2	J00KX3	J00KX4	
J00KX0	J00KX1	J00KX5			

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

2. INSTRUMENT TUNING AND CALIBRATION (Levels D and E)

GC/MS tuning/performance check acceptable? ..... Yes No N/A

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

Continuing calibrations 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: _____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

Calibration blanks analyzed? (Levels D, E) ..... Yes No N/A
Calibration blank 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/trip blanks analyzed? (Levels C, D, E) ..... Yes No N/A
Field/trip blank results acceptable? (Levels C, D, E) ..... Yes No N/A
Transcription/calculation errors? (Levels D, E) ..... Yes No N/A

Comments: di-n-butylphthalate + bis(2ethylhexyl) phthalate in FB

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

Surrogates/system monitoring compounds analyzed? ..... Yes No N/A
Surrogate/system monitoring compound recoveries acceptable? ..... Yes No N/A
Surrogates traceable? (Levels D, E) ..... Yes No N/A
Surrogates expired? (Levels D, E) ..... Yes No N/A
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? (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: NO PAS

MS/MSD not prepped w/SDG – J all

GC/MS ORGANIC DATA VALIDATION CHECKLIST

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

MS/MSD samples analyzed? ..... Yes No N/A
MS/MSD RPD values 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: MS/MSD not ~~done~~ w/SDG — J all prepped

6. SYSTEM PERFORMANCE (Levels D and E)

Internal standards analyzed? ..... Yes No N/A
Internal standard areas acceptable? ..... Yes No N/A
Internal standard retention times 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:

7. HOLDING TIMES (all levels)

Samples properly preserved? ..... Yes No N/A
Sample holding times acceptable? ..... Yes No N/A

Comments:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, QUANTITATION, AND DETECTION LIMITS (all levels)

Compound identification acceptable? (Levels D, E) ..... Yes No N/A
Compound quantitation acceptable? (Levels D, E) ..... Yes No N/A
Results reported for all requested analytes? ..... 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
Laboratory properly identified and coded all TIC? (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: 328 over TDL

9. SAMPLE CLEANUP (Levels D and E)

GPC cleanup performed? ..... Yes No N/A
GPC check performed? ..... Yes No N/A
GPC check recoveries acceptable? ..... Yes No N/A
GPC calibration performed? ..... Yes No N/A
GPC calibration check performed? ..... Yes No N/A
GPC calibration check retention times acceptable? ..... Yes No N/A
Check/calibration materials traceable? ..... Yes No N/A
Check/calibration materials Expired? ..... Yes No N/A
Analytical batch QC given similar cleanup? ..... Yes No N/A
Transcription/Calculation Errors? ..... Yes No N/A

Comments:

Date: 12 May 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Waste Sites Confirmation Sampling - Soil - Waste Site 100-B-1
Subject: Inorganics - Data Package No. H2146-LLI (SDG No. H2146)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2146-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
J00KY1	4/2/03	Soil	C	See note 1
J00KY0	4/2/03	Soil	C	See note 1
J00KX8	4/2/03	Soil	C	See note 1
J00KX9	4/2/03	Soil	C	See note 1
J00KX6	4/2/03	Soil	C	See note 1
J00KX7	4/2/03	Soil	C	See note 1
J00KW9	4/3/03	Soil	C	See note 1
J00KX2	4/3/03	Soil	C	See note 1
J00KX3	4/3/03	Soil	C	See note 1
J00KX4	4/3/03	Soil	C	See note 1
J00KX0	4/3/03	Soil	C	See note 1
J00KX1	4/7/03	Soil	C	See note 1
J00KX5	4/3/03	Soil	C	See note 1

1 - Chromium VI by 7196A; ICP metals by 6010B; mercury by 7471A; petroleum hydrocarbons by 418.1.

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 December 2001) and the Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). 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 30 days for chromium VI, 6 months for ICP metals and 28 days for mercury and TPH.

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.

Due to preparation blank contamination, the petroleum hydrocarbon results in samples J00KY0, J00KX8, J00KX9, J00KX6, J00KX7, J00KX3 and J00KX4 were qualified as undetected and flagged "U".

Due to preparation blank contamination, the chromium(total) results in sample J00KY1 was qualified as undetected and flagged "U".

All other preparation blank results were acceptable.

Field (Equipment) Blank

One equipment blank (J00KY1) was submitted for analysis. Arsenic, barium, lead and chromium(total) were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **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% (50-150% for petroleum hydrocarbons). 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 (J00KW9/J00KX0) were submitted for analysis. Field duplicate results are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the target detection limits (TDLs) to ensure that laboratory detection levels meet the required criteria. All chromium VI results exceeded the analyte specific TDL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2146-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 preparation blank contamination, the petroleum hydrocarbon results in samples J00KY0, J00KX8, J00KX9, J00KX6, J00KX7, J00KX3 and J00KX4 were qualified as undetected and flagged "U". Due to preparation blank contamination, the chromium(total) results in sample J00KY1 was qualified as undetected and flagged "U".

All chromium VI results exceeded the analyte specific TDL. Under the BHI statement of work, no qualification is required.

REFERENCES

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

BHI-01249, Rev. 3, *Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort*, Bechtel Hanford Incorporated, March 2003.

DOE/RL-96-22, Rev. 3, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, December 2001.

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: H2146	REVIEWER: TLI	DATE: 5/12/03	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium(total)	U	J00KY1	Blank contamination
Total petroleum hydrocarbons	U	J00KY0, J00KX8, J00KX9, J00KX6, J00KX7, J00KX3, J00KX4	Blank contamination

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, SOIL MATRIX, MG/KG

Project: BECHTEL-HANFORD																					
Laboratory: LLI																					
Case	SDG: H2146																				
Sample Number		J00KY0		J00KY1		J00KX8		J00KX9		J00KX6		J00KX7		J00KW9		J00KX2					
Remarks				E. Blank																	
Location		100-B-1		100-B-1		100-B-1		100-B-1		100-B-1		100-B-1		100-B-1		100-B-1					
Sample Date		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/2/03		4/3/03		4/3/03					
Inorganics	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Silver	0.2	0.09	U	0.07	U	0.07	U	0.08	U	0.08	U	0.06	U	0.06	U	0.08	U				
Arsenic	1	4.9		0.35		3.9		5.4		2.1		4.0		2.5		2.7					
Barium	20	61.1		0.98		56.5		92.8		87.3		39.6		87.1		88.7					
Cadmium	0.2	0.07		0.03	U	0.04		0.04	U	0.04	U	0.03	U	0.08		0.08					
Chromium(total)	1	11.9		0.18	U	15.9		13.0		11.8		8.6		13.5		15.4					
Mercury	0.2	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.01	U	0.02	U	0.02	U				
Lead	5	7.0		0.35		4.7		7.8		5.6		3.1		8.9		9.7					
Selenium	1	0.39	U	0.31	U	0.33	U	0.37	U	0.38	U	0.29	U	0.28	U	0.36	U				
Chromium VI	0.1	0.43	U	NA		0.42	U	0.42	U	0.42	U	0.42	U	0.42	U	0.42	U				
Petroleum Hydrocarbons	5	6.5	U	NA		6.0	U	9.5	U	7.1	U	6.0	U	1340		8200					
Sample Number		J00KX3		J00KX4		J00KX0		J00KX1		J00KX5											
Remarks						Duplicate															
Location		100-B-1		100-B-1		100-B-1		100-B-1		100-B-1											
Sample Date		4/3/03		4/3/03		4/3/03		4/7/03		4/3/03											
Inorganics	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q										
Silver	0.2	0.08	U	0.08	U	0.08	U	0.08	U	0.08	U										
Arsenic	1	2.7		1.4		2.5		2.4		2.9											
Barium	20	61.2		50.8		96.4		46.1		63.4											
Cadmium	0.2	0.04	U	0.04	U	0.09		0.04	U	0.04	U										
Chromium(total)	1	10.8		7.8		13.1		12.3		10.5											
Mercury	0.2	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U										
Lead	5	4.0		3.0		9.8		3.6		4.4											
Selenium	1	0.37	U	0.37	U	0.35	U	0.35	U	0.37	U										
Chromium VI	0.1	0.43	U	0.42	U	0.42	U	0.42	U	0.43	U										
Petroleum Hydrocarbons		6.0	U	4.8	U	1390		438		3770											

000011

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. NA = Not analyzed

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/16/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00KY1	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	0.35	MG/KG	0.30	1.0
		Barium, Total	0.98	MG/KG	0.008	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.18 U	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	0.35	MG/KG	0.22	1.0
		Selenium, Total	0.31 u	MG/KG	0.31	1.0
-002	J00KY0	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	4.9	MG/KG	0.38	1.0
		Barium, Total	61.1	MG/KG	0.01	1.0
		Cadmium, Total	0.07	MG/KG	0.04	1.0
		Chromium, Total	11.9	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	7.0	MG/KG	0.28	1.0
		Selenium, Total	0.39 u	MG/KG	0.39	1.0
-003	J00KX8	Silver, Total	0.07 u	MG/KG	0.07	1.0
		Arsenic, Total	3.9	MG/KG	0.32	1.0
		Barium, Total	56.5	MG/KG	0.009	1.0
		Cadmium, Total	0.04	MG/KG	0.04	1.0
		Chromium, Total	15.9	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.7	MG/KG	0.23	1.0
		Selenium, Total	0.33 u	MG/KG	0.33	1.0
-004	J00KX9	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	5.4	MG/KG	0.36	1.0
		Barium, Total	92.8	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	13.0	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	7.8	MG/KG	0.27	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0

R 5/7/03

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/16/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	J00KX6	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.1	MG/KG	0.37	1.0
		Barium, Total	87.3	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	11.8	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	5.6	MG/KG	0.27	1.0
		Selenium, Total	0.38 u	MG/KG	0.38	1.0
-006	J00KX7	Silver, Total	0.06 u	MG/KG	0.06	1.0
		Arsenic, Total	4.0	MG/KG	0.28	1.0
		Barium, Total	39.6	MG/KG	0.008	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	8.6	MG/KG	0.05	1.0
		Mercury, Total	0.01 u	MG/KG	0.01	1.0
		Lead, Total	3.1	MG/KG	0.21	1.0
		Selenium, Total	0.29 u	MG/KG	0.29	1.0
-007	J00KW9	Silver, Total	0.06 u	MG/KG	0.06	1.0
		Arsenic, Total	2.5	MG/KG	0.27	1.0
		Barium, Total	87.1	MG/KG	0.008	1.0
		Cadmium, Total	0.08	MG/KG	0.03	1.0
		Chromium, Total	13.5	MG/KG	0.05	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	8.9	MG/KG	0.20	1.0
		Selenium, Total	0.28 u	MG/KG	0.28	1.0
-008	J00KX2	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.7	MG/KG	0.35	1.0
		Barium, Total	88.7	MG/KG	0.01	1.0
		Cadmium, Total	0.08	MG/KG	0.04	1.0
		Chromium, Total	15.4	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	9.7	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0

pr 5/7/03

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/16/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	J00KX3	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.7	MG/KG	0.36	1.0
		Barium, Total	61.2	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	10.8	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.0	MG/KG	0.27	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
-010	J00KX4	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	1.4	MG/KG	0.36	1.0
		Barium, Total	50.8	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	7.8	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.0	MG/KG	0.27	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
-011	J00KX0	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.5	MG/KG	0.34	1.0
		Barium, Total	96.4	MG/KG	0.01	1.0
		Cadmium, Total	0.09	MG/KG	0.04	1.0
		Chromium, Total	13.1	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	9.8	MG/KG	0.26	1.0
		Selenium, Total	0.35 u	MG/KG	0.35	1.0
-012	J00KX1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.4	MG/KG	0.34	1.0
		Barium, Total	46.1	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	12.3	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.6	MG/KG	0.26	1.0
		Selenium, Total	0.35 u	MG/KG	0.35	1.0

Per 5/7/03

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/16/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-013	J00KX5	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Arsenic, Total	2.9	MG/KG	0.36	1.0
		Barium, Total	63.4	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	10.5	MG/KG	0.06	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.4	MG/KG	0.27	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0

5/7/03

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/15/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00KY1	% Solids	99.8	%	0.01	1.0
-002	J00KY0	% Solids	92.4	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Petroleum Hydrocarbons	6.5 U	MG/KG	3.6	1.0
-003	J00KX8	% Solids	94.7	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Petroleum Hydrocarbons	6.0 U	MG/KG	3.5	1.0
-004	J00KX9	% Solids	94.7	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Petroleum Hydrocarbons	9.5 U	MG/KG	3.5	1.0
-005	J00KX6	% Solids	95.6	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Petroleum Hydrocarbons	7.1 U	MG/KG	3.5	1.0
-006	J00KX7	% Solids	94.8	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Petroleum Hydrocarbons	6.0 U	MG/KG	3.5	1.0
-007	J00KW9	% Solids	95.2	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Petroleum Hydrocarbons	1340	MG/KG	35.0	10.0
-008	J00KX2	% Solids	95.8	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Petroleum Hydrocarbons	8200	MG/KG	434	125
-009	J00KX3	% Solids	93.8	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Petroleum Hydrocarbons	6.0 U	MG/KG	3.6	1.0
-010	J00KX4	% Solids	95.0	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Petroleum Hydrocarbons	4.8 U	MG/KG	3.5	1.0

5/7/03

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 04/15/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-011	J00KX0	% Solids	95.3	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Petroleum Hydrocarbons	1390	MG/KG	35.0	10.0
-012	J00KX1	% Solids	94.3	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
		Petroleum Hydrocarbons	438	MG/KG	17.7	5.0
-013	J00KX5	% Solids	93.7	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
		Petroleum Hydrocarbons	3770	MG/KG	88.7	25.0

5/7/03

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015
LVL#: 0304L140
SDG/SAF#: H2146/B03-015

W.O.#: 11343-606-001-9999-00
Date Received: 04-09-03

METALS CASE NARRATIVE

1. This narrative covers the analyses of 13 soil samples.

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

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

4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.

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. The preparation/method blanks for 2 analytes were outside 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.

   a). The MB results for Barium and Chromium were greater than the Practical Quantitation Limit (PQL) {3 x the (IDL) Instrument Detection Level} and sample J00KY1 read less than 20 times the MB concentration. However, no corrective action criteria for MBs were provided in SW846 method 6010B. The sample results were reported herein "uncorrected" for the levels found in the MB.

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.

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 25 pages.

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

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

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

04-17-03
Date

gmb/m04-140

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD B03-015 H2146
LVL#: 0304L140

W.O.#: 11343-606-001-9999-00
Date Received: 04-09-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 13 soil samples.

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

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

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blank for Chromium VI was within the method criteria, however the method blanks for Petroleum Hydrocarbon (PHC) were above the method detection limit and below the estimated quantitation limit.

6. The Laboratory Control Samples (LCS) for PHC and Chromium VI were within the laboratory control limits.

7. The matrix spike recoveries for PHC and Chromium VI were within the 75-125% control limits. The matrix spike duplicate for PHC was within the 20% Relative Percent Difference (RPD) control limit.

8. The replicate analyses for Percent Solids and Chromium VI were within the 20% RPD control limit.

9. During the PHC analysis, samples J00KW9 and J00KX2 appeared cloudy following the silica gel treatment. In addition, due to silica gel saturation, samples J00KX2 and J00KX5 were diluted prior to the initial analysis.

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

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 21 pages.

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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.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

04-16-03
Date

pefli04-140

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B03-015-39	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1	SAF No.: B03-015	
Ice Chest No.: SEE OSR	Field Logbook No.: EL-1578	COA: C17HXB671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030 180		Bill of Lading/Air Bill No.: SEE OSR

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive Tie To J00KW7

Special Handling and/or Storage
Cool 4C

Preservation	None	None	Cool 4C	Cool 4C								
Type of Container	aG	aG	aG	aG								
No. of Container(s)	1	1	1	1								
Volume	1000mL	60mL	120mL	60mL								
SAMPLE ANALYSIS	See Item (1) in Special Instructions	See Item (2) in Special Instructions.	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)								
Sample No.	Matrix *	Sample Date	Sample Time									
J00KY1	SOIL	4-2-03	0848	X	X	X	X					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
Remy Bowers	4-2-03/1645	R.F. 3C 3728	4-2-03/1645
3C 3728	4-8-03 1000	R. Fellows	4-8-03 1000
R. Fellows	4-8-03 1000	Fed Ex	
Fed Ex	4/9/03 1010		4/9/03 1010
Fed Ex	4-9-03 1010		4/9/03 1010

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155)
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Do not use this sample for lab Q.C.

Personnel not available to relinquish samples from the 3728 Ref# 3C on 4/8/03

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Sol
DL=Drum Liq
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	B03-015-38	Page 1 of 1
Collector: Fahlberg/Bowers	Company Contact: Renee Nielson; Telephone No.: 372-9658	Project Coordinator: KESSNER, JH	Price Code: 8B; Data Turnaround: 7 Days
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1	SAF No.: B03-015	Air Quality ☐
Ice Chest No.: SEE OSPC	Field Logbook No.: EL-1578; COA: C17HXB671C	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: A030180	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To J00KW7

Special Handling and/or Storage
Cool 4°C

000024

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			
Sample No.	Matrix *	Sample Date	Sample Time							
J00KY0	SOIL	4-2-03	1275	X	X	X	X	X		X	Trench 4c
J00KX8	Soil	4-2-03	0850	X	X	X	X	X		X	Trench 4a
J00KX9	Soil	4-2-03	1010	X	X	X	X	X		X	Trench 4b
J00KX6	Soil	4-2-03	1340	X	X	X	X	X		X	Area 3 surface of pit
J00KX7	Soil	4-2-03	1510	X	X	X	X	X		X	Area 3 sub-surface @

CHAIN OF POSSESSION	Sign/Print Names
Relinquished By/Removed From: Bowers; Date/Time: 4-2-03/1615	Received By/Stored In: RFJC 3728; Date/Time: 4-2-03/1615
Relinquished By/Removed From: 3C 3728; Date/Time: 4-8-03 1000	Received By/Stored In: RFGOO; Date/Time: 1000 4-8-03
Relinquished By/Removed From: RFGOO; Date/Time: 1000 4-8-03	Received By/Stored In: Fed Ex; Date/Time:
Relinquished By/Removed From: Fed Ex; Date/Time: 4/9/03 1010	Received By/Stored In: 4-9-03 1010; Date/Time:
Relinquished By/Removed From:	Received By/Stored In:
Relinquished By/Removed From:	Received By/Stored In:

SPECIAL INSTRUCTIONS
(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref# 3C on 4/8/03

Matrix *
S=Soil
SE=Sediment
SO=Solid
Sl=Sludge
W = Water
O=Oil
A=Air
DS=Drum Sol
DL=Drum Liq
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	B03-015-27	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1		SAF No.: B03-015
Ice Chest No.: SEE OSR	Field Logbook No.: EL-1578	COA: C17HXB671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: A030 180		Bill of Lading/Air Bill No.: SEE OSR

POSSIBLE SAMPLE HAZARDS/REMARKS: Radioactive Tie to J00KW7

Special Handling and/or Storage: Cool 4°C

000025

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See item (1) in Special Instructions	See item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			
Sample No.	Matrix *	Sample Date	Sample Time							
J00KW9	SOIL	4-3-03	1215	X	X	X	X	X	X	Area 1 surface (pit)
J00KX2	Soil	4-3-03	1041	X	X	X	X	X	X	Area 2 surface (pit)
J00KX3	Soil	4-3-03	1059	X	X	X	X	X	X	bottom of trench 2C
J00KX4	Soil	4-3-03	0970	X	X	X	X	X	X	" 26
J00KX0	Soil	4-3-03	1215	X	X	X	X	X	X	Area 1 surface (pit)

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From: Doug Bowers	Doug Bowers	4-3-03/1730	Received By/Stored In: RFC	4-3-03/1730
Relinquished By/Removed From: 3C 3728		4-8-03 1000	Received By/Stored In: RFC	4-8-03 1000
Relinquished By/Removed From: ERC		4-8-03 1000	Received By/Stored In: FedEx	
Relinquished By/Removed From: FedEx		4/9/03 1010	Received By/Stored In:	4-9-03 1010
Relinquished By/Removed From:			Received By/Stored In:	
Relinquished By/Removed From:			Received By/Stored In:	

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta; ~~Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89/90; Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)~~ AC 5/31/03

(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref# 3C on 4/8/03

Matrix *: S=Soil; SE=Sediment; SO=Solid; SL=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	B03-015-29	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson — Telephone No.: 372-9658	Project Coordinator: KESSNER, JH	Price Code: 8B — Data Turnaround: 7 Days
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1	SAF No.: B03-015	Air Quality ☐
Ice Chest No.: SEE OSR	Field Logbook No.: EL-1578 — COA: C17HXB671C	Method of Shipment: Federal Express	
Shipped To: TMA/RECRA	Offsite Property No.: A030180	Bill of Lading/Air Bill No.: SEE OSR	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
TiCTB 300 KW7

Special Handling and/or Storage
Cool 4°C

Preservation	None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C			
Type of Container	sG	sG	sG	sG	sG	sG	sG			
No. of Container(s)	1	1	1	1	1	1	1			
Volume	1000mL	60mL	120mL	120mL	120mL	60mL	60mL			
SAMPLE ANALYSIS	See Item (1) in Special Instructions.	See Item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1			

000026

Sample No.	Matrix *	Sample Date	Sample Time									
J00KX1	SOIL	4-7-03	0841	X	X	X	X	X		X	area1 sub-surface soil	

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From	Doug Bowers	4-7-03 1040	Ref 3C 3728	4-7-03 1040
Relinquished By/Removed From	3C 3728	4-8-03 1000	Received By/Stored In	1800
Relinquished By/Removed From	R Fahlberg	4-8-03 1000	Received By/Stored In	Fed Ex
Relinquished By/Removed From	Fed Ex	4-9-03 1010	Received By/Stored In	4-9-03 1010
Relinquished By/Removed From		Date/Time	Received By/Stored In	Date/Time
Relinquished By/Removed From		Date/Time	Received By/Stored In	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728 Ref # 3C on 4/8/03

Matrix *
S-Soil
SE-Sediment
SO-Solid
SL-Sludge
W-Water
O-Oil
A-Air
DS-Drum Solid
DL-Drum Liquid
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	B03-015-33	Page 1 of 1

Collector: Fahlberg/Bowers	Company Contact: Renee Nielson	Telephone No.: 372-9658	Project Coordinator: KESSNER, JH
Price Code: 8B	Data Turnaround: 7 Days	Air Quality ☐	
Project Designation: Remaining Sites Confirmation Sampling-Soil	Sampling Location: 100-B-1	SAF No.: B03-015	
Ice Chest No.: SEE OSPC	Field Logbook No.: EL-1578	COA: C17HXB671C	Method of Shipment: Federal Express
Shipped To: TMA/RECRA	Offsite Property No.: R030 180	Bill of Lading/Air Bill No.: SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS
Radioactive
Tie To J00KW7

Special Handling and/or Storage
Cool 4°C

000027

SAMPLE ANALYSIS												
Preservation				None	None	Cool 4C	Cool 4C	Cool 4C	Cool 4C	Cool 4C		
Type of Container				sG	sG	sG	sG	sG	sG	sG		
No. of Container(s)				1	1	1	1	1	1	1		
Volume				1000mL	60mL	120mL	120mL	120mL	60mL	60mL		
				See Item (1) in Special Instructions	See Item (2) in Special Instructions.	Chromium Hex - 7196	Pesticides - 8081; PCBs - 8082	Semi-VOA - 8270A (TCL)	VOA - 8260A (TCL)	TPH (Total) - 418.1		
Sample No.	Matrix *	Sample Date	Sample Time									
J00KX5	SOIL	4-3-03	1320	X	X	X	X	X		X	are 2" sub-surface	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By/Removed From: Tony Bowers	Date/Time: 4-3-03/1530	Received By/Stored In: Ref 3C 3729	Date/Time: 4-3-03/1530
Relinquished By/Removed From: 3C 3728	Date/Time: 4-8-03 1000	Received By/Stored In: R. Fahlberg R. Fahlberg	Date/Time: 1000 4-8-03
Relinquished By/Removed From: ERC R. Fahlberg R. Fahlberg	Date/Time: 1000 4-8-03	Received By/Stored In: Fed Ex	Date/Time:
Relinquished By/Removed From: Fed Ex	Date/Time: 4-9-03 1010	Received By/Stored In:	Date/Time: 4-9-03 1010
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:
Relinquished By/Removed From:	Date/Time:	Received By/Stored In:	Date/Time:

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gross Alpha & Gross Beta
(2) ICP Metals - 6010TR (Client List) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); Mercury - 7471 - (CV)

Personnel not available to relinquish samples from the 3728
Ref # 3C on 4/8/03

Matrix *
S=Soil
SD=Sediment
SO=Solid
SL=Sludge
W=Water
O=Oil
A=Air
DS=Drum Sol
DL=Drum Liq
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

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-B-1		DATA PACKAGE:	H2146	
VALIDATOR:	TLI	LAB: LLI		DATE: 5/6/03	
CASE:			SDG:	H2146	

ANALYSES PERFORMED

SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide	CRVI	TPH

SAMPLES/MATRIX

J00KY1	J00KY0	J00KX8	J00KX9	J00KX6
J00KX7	J00KW9	J00KX2	J00KX3	J00KX4
J00KX0	J00KX1	J00KX5		

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: Y1- <5x MB U
U — TPH in MB Y0, Y8, Y9, Y6, Y7, Y3, Y4
Y1- EB Arsenic Barium chromium (total)
+ lead in EB

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: NO PAS

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: all CR VI run

Appendix 6

Additional Documentation Requested by Client

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/16/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	03L0193-MB1	Silver, Total	0.10	MG/KG	0.08	1.0
		Arsenic, Total	0.35 u	MG/KG	0.35	1.0
		Barium, Total	0.05	MG/KG	0.01	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Chromium, Total	0.20	MG/KG	0.06	1.0
		Lead, Total	0.26 u	MG/KG	0.26	1.0
		Selenium, Total	0.36 u	MG/KG	0.36	1.0
BLANK1	03C0082-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/16/03

CLIENT: TNUHANFORD B03-015 H2146

LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	J00KY0	Silver, Total	4.9	0.09u	5.3	92.5	1.0
		Silver, Total MSD	5.0	0.09u	5.3	94.3	1.0
		Arsenic, Total	198	4.9	212	90.8	1.0
		Arsenic, Total MSD	198	4.9	210	91.7	1.0
		Barium, Total	256	61.1	212	91.8	1.0
		Barium, Total MSD	263	61.1	210	95.9	1.0
		Cadmium, Total	4.8	0.07	5.3	89.2	1.0
		Cadmium, Total MSD	4.8	0.07	5.3	89.2	1.0
		Chromium, Total	30.9	11.9	21.2	89.6	1.0
		Chromium, Total MSD	31.7	11.9	21.0	94.3	1.0
		Mercury, Total	0.18	0.02u	0.18	100.6	1.0
		Lead, Total	54.8	7.0	53.1	90.0	1.0
		Lead, Total MSD	55.1	7.0	52.5	91.6	1.0
		Selenium, Total	189	0.39u	212	89.0	1.0
		Selenium, Total MSD	188	0.39u	210	89.2	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/16/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-002REP	J00KY0	Silver, Total	0.09u	0.09u	NC	1.0
		Arsenic, Total	4.9	4.3	13.0	1.0
		Barium, Total	61.1	58.0	5.2	1.0
		Cadmium, Total	0.07	0.08	13.9	1.0
		Chromium, Total	11.9	12.4	4.1	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Lead, Total	7.0	7.2	2.8	1.0
		Selenium, Total	0.39u	0.39u	NC	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 04/15/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LVI022-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0
BLANK10	03LHC015-MB1	Petroleum Hydrocarbons	5.7	MG/KG	3.3	1.0
BLANK10	03LHC016-MB1	Petroleum Hydrocarbons	3.4	MG/KG	3.3	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 04/15/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-003	J00KX8	Petroleum Hydrocarbons	144	6.0	148	93.2	1.0
		Petroleum Hydrocarbons	142	6.0	147	92.4	1.0
-013	J00KX5	Soluble Chromium VI	4.1	0.43 u	4.3	92.0	1.0
		Insoluble Chromium VI	1140	0.43 u	1280	88.9	100
BLANK10	03LVI022-MB1	Soluble Chromium VI	4.0	0.40u	4.0	100.6	1.0
		Insoluble Chromium VI	1170	0.40u	1180	99.5	100
LCS10	03LHC015-LC1	Petroleum Hydrocarbons	134	3.3 u	140	95.4	1.0
LCS10	03LHC016-LC1	Petroleum Hydrocarbons	132	3.3 u	140	94.6	1.0

Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 04/15/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-003	J00KX8	Petroleum Hydrocarbons	93.2	92.4	0.88

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 04/15/03

CLIENT: TNUHANFORD B03-015 H2146 LVL LOT #: 0304L140

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	J00KY1	% Solids	99.8	99.9	0.030	1.0
-013REP	J00KX5	Chromium VI	0.43u	0.43u	NC	1.0

13