

0061274

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

MAIL COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan

BD *1/19/04*

INITIAL/DATE

SAF-B03-015

SDG H 2354

Sample Location/Waste Site: 115-B Gas Recirc 100-B-14:2

RECEIVED
FEB 05 2004

EDMC

Date: 27 November 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site Evaluation for
100-B-14:2 Sanitary Sewer (100-B-14 Process and Sanitary Sewer
Underground Pipelines).
Subject: Pesticide/PCB - Data Package No. H2354-LLI (SDG No. H2354)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2354-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	Media	Validation	Waste Site	Analysis
J00Y83	9/18/03	Soil	C	100-B-14	See note 1
J00Y84	9/18/03	Soil	C	100-B-14	See note 1
J00Y85	9/18/03	Soil	C	100-B-14	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 Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). Appendices 1 through 5 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.

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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 quantitation limit (RQL). 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 RQL, the result is qualified as undetected and elevated to the RQL.

All method blank target compound results were acceptable.

Field Blanks

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 50% to 150%. 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.

Due to the matrix spike and matrix spike duplicate being diluted out, all pesticide results were qualified as estimates and flagged "J".

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Due to the lack of an LCS and MS/MSD analysis, all toxaphene results were qualified as estimates and flagged "J".

All other accuracy 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.

All 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.

Due to the matrix spike and matrix spike duplicate being diluted out, all pesticide results were qualified as estimates and flagged "J".

All other matrix spike/matrix spike duplicate results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (J00Y84/J00Y85) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory blanks. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the Remaining Waste Sites RQLs to ensure that laboratory detection levels meet the required criteria. All reported pesticide results exceeded the RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data Package No. H2354-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 being diluted out, all pesticide results were qualified as estimates and flagged "J". Due to the lack of an LCS and MS/MSD analysis, all toxaphene results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, 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 pesticide results exceeded the RQL. 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.

Appendix 1

Glossary of Data Reporting Qualifiers

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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).

000006

Appendix 2

Summary of Data Qualification

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Pesticide/PCB DATA QUALIFICATION SUMMARY

SDG: H2354	REVIEWER: TLI	DATE: 11/27/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Toxaphene	J	All	No LCS or MS/MSD analysis
All pesticide results	J	All	MS/MSD recovery

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: BECHTEL-HANFORD													
Laboratory: Lionville Laboratory Inc.													
Case:		SDG: H2354											
Sample Number		J00Y83		J00Y84		J00Y85							
Remarks						Duplicate							
Sample Date		9/18/03		9/18/03		9/18/03							
Extraction Date		9/26/03		9/26/03		9/26/03							
Analysis Date		9/29/03		10/2/03		9/29/03							
PCB	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aroclor-1016	20	13	U	14	U	14	U						
Aroclor-1221	20	13	U	14	U	14	U						
Aroclor-1232	20	13	U	14	U	14	U						
Aroclor-1242	20	13	U	14	U	14	U						
Aroclor-1248	20	13	U	14	U	14	U						
Aroclor-1254	20	13	U	14	U	14	U						
Aroclor-1260	20	13	U	14	U	14	U					16	
Sample Number		J00Y83		J00Y84		J00Y85							
Remarks						Duplicate							
Sample Date		9/18/03		9/18/03		9/18/03							
Extraction Date		9/26/03		9/26/03		9/26/03							
Analysis Date		9/29/03		10/2/03		9/29/03							
Pesticide	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Alpha-BHC	5	17	UJ	17	UJ	17	UJ						
Beta-BHC	5	17	UJ	17	UJ	17	UJ						
Delta-BHC	5	17	UJ	17	UJ	17	UJ						
Gamma-BHC (Lindane)	5	17	UJ	17	UJ	17	UJ						
Heptachlor	5	17	UJ	17	UJ	17	UJ						
Aldrin	5	17	UJ	17	UJ	17	UJ						
Heptachlor Epoxide	5	17	UJ	17	UJ	17	UJ						
Endosulfan I	5	17	UJ	17	UJ	17	UJ						
Dieldrin	5	34	UJ	34	UJ	34	UJ						
4,4'-DDE	5	34	UJ	34	UJ	34	UJ						
Endrin	5	34	UJ	34	UJ	34	UJ						
Endosulfan II	5	34	UJ	34	UJ	34	UJ						
4,4'-DDD	5	34	UJ	34	UJ	34	UJ						
Endosulfan Sulfate	5	34	UJ	34	UJ	34	UJ						
4,4'-DDT	5	34	UJ	34	UJ	34	UJ						
Methoxychlor	5	170	UJ	170	UJ	170	UJ						
Endrin Ketone	5	34	UJ	34	UJ	34	UJ						
Endrin Aldehyde	5	34	UJ	34	UJ	34	UJ						
alpha-Chlordane	5	17	UJ	17	UJ	17	UJ						
gamma-Chlordane	5	17	UJ	17	UJ	17	UJ						
Toxaphene	5	1700	UJ	1700	UJ	1700	UJ						

000010

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.

PCBs by GC

Report Date: 10/06/03 14:48

RFW Batch Number: 0309L565

Client: TNUHANFORD B03-015 H2354 Work Order: 11343606001 Page: 1

Sample Information	Cust ID:	J00Y83	J00Y83	J00Y83	J00Y84	J00Y85	PBLKHK
	RFW#:	001	001 MS	001 MSD	002	003	03LE1210-MB1
	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:	Decachlorobiphenyl	85 %	95 %	90 %	90 %	90 %	90 %
	Tetrachloro-m-xylene	75 %	85 %	80 %	85 %	75 %	70 %
		-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----	-----fl-----
Aroclor-1016		13 U	92 %	83 %	14 U	14 U	13 U
Aroclor-1221		13 U	13 U	13 U	14 U	14 U	13 U
Aroclor-1232		13 U	13 U	13 U	14 U	14 U	13 U
Aroclor-1242		13 U	13 U	13 U	14 U	14 U	13 U
Aroclor-1248		13 U	13 U	13 U	14 U	14 U	13 U
Aroclor-1254		13 U	13 U	13 U	14 U	14 U	13 U
Aroclor-1260		13 U	93 %	85 %	14 U	16	13 U

Cust ID: PBLKHK BS

Sample Information RFW#: 03LE1210-MB1
 Matrix: SOIL
 D.F.: 1.00
 Units: UG/KG

000013

Surrogate:	Decachlorobiphenyl	115 %
	Tetrachloro-m-xylene	100 %
		-----fl-----
Aroclor-1016		106 %
Aroclor-1221		13 U
Aroclor-1232		13 U
Aroclor-1242		13 U
Aroclor-1248		13 U
Aroclor-1254		13 U
Aroclor-1260		105 %

11/22/03

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

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000014



Analytical Report

Client: TNU-HANFORD B03-015
LVL #: 0309L565
SDG/SAF #: H2354/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 09-25-03

PCB

The set of samples consisted of three (3) soil samples collected on 09-18-03.

The samples and their associated QC samples were extracted on 09-26-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 09-29,30-03 and 10-02-03. 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 LVL's sample acceptance policy.
2. All required holding times for extraction and analysis have been met.
3. The samples and their associated QC samples received a Sulfuric Acid cleanup.
3. The method blank was below the reporting limits for all target compounds.
4. All surrogate recoveries were within acceptance criteria.
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.

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 10 pages.

000015

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

10/15/13
Date

pefr:\group\data\pest\mu hanford\09L-565.pcb



000016



Analytical Report

Client: TNU-HANFORD B03-015
LVL #: 0309L565
SDG/SAF #: H2354/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 09-25-03

PESTICIDE

The set of samples consisted of three (3) soil samples collected on 09-18-03.

The samples and their associated QC samples were extracted on 09-26-03 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 10-05-03. 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 sample 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. One (1) of fourteen (14) surrogate recoveries was outside QC limits; however, the surrogate recovery acceptance criteria were met (i.e., no more than one outlier per sample).
6. Seven (7) of twenty (20) blank spike recoveries were outside acceptance criteria. A copy of the Sample Discrepancy Report (SDR) has been enclosed.
7. Matrix spike recoveries were unobtainable due to the dilution required for analysis.
8. All samples and their matrix QC required 10-fold instrument dilutions due to chromatographic anomalies. Reporting limits have been adjusted to reflect the necessary dilutions.
9. All initial calibrations associated with this data set were within acceptance criteria.
10. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

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.

000017

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 data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.


Jason Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10/15/03
Date

pefr:\group\data\pest\tnu hanford\09L-565.pes



000018

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						BUJ-013-100	
Collector R. Nielson/D. Bowers		Company Contact Ella Feist		Telephone No. 372-9140		Project Coordinator KESSNER, JH		Price Code 8L	Data Turnaround
Project Designation Remaining Sites Confirmation Sampling-Soil		Sampling Location 115-B Gas Recirc. Bldg. Pipelines - A14 (100-B-14)				SAF No. B03-015		Air Quality <input type="checkbox"/>	21 Days 7/18/03
Ice Chest No. ERC-96009		Field Logbook No. EL-1578-1		COA C17HXB671C		Method of Shipment Federal Express			
Shipped To EDERLINE SERVICES (Formerly TMA) RECRA		Offsite Property No. A030375				Bill of Lading/Air Bill No. SEE OSPC			
POSSIBLE SAMPLE HAZARDS/REMARKS			Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C
Special Handling and/or Storage			Type of Container	aG	aG	aG	aG	aG	aG
			No. of Container(s)	1	1	1	1	1	1
			Volume	1000mL	60mL	250mL	120mL	250mL	120mL
			SAMPLE ANALYSIS			See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196
000019	Sample No.	Matrix *	Sample Date	Sample Time					
	J00Y83	SOIL	9/18/03	0833		X	X	X	X
CHAIN OF POSSESSION					SPECIAL INSTRUCTIONS				Matrix *
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		<p>If gross alpha is detected above background, then contact Joan Kessner to determine if further alpha specific analyses is needed. If gross beta is detected above background, then strontium analyses will be performed.</p> <p>(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; 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); RWA-18-03</p> <p>(2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)</p> <p>Personnel not available to Relinquish samples from 3728 Ref# 3con 9124103</p>	
Dony Bowers		9/18/03		N.F. JC		9-18-03/1470			
REF JC		92403 1300		SIGALC		92403 1300			
SIGALC		92403 1300		FED EX					
Chedon		9-25-03/0925		D. J. ...		9-25-03/0925			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time			
LABORATORY SECTION		Received By		Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time	

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B03-015-137	Page 1 of 1
Collector R. Nielson/D. Bowers	Company Contact Ella Feist	Telephone No. 372-9140	Project Coordinator KESSNER, JH		Price Code 8L	Data Turnaround
Project Designation Remaining Sites Confirmation Sampling-Soil		Sampling Location 115-B Gas Recirc. Bldg. Pipelines - A16 (100-B-14)		SAF No. B03-015	Air Quality <input type="checkbox"/>	21 Days 7/10/03
Ice Chest No. ERC 02 107	Field Logbook No. EL-1578-1	COA C17HXB671C	Method of Shipment Federal Express		Bill of Lading/Air Bill No. SEE OSPC	
Shipped To RECRA 9/24/03 BERKLINE SERVICES (Formerly TMA)		Offsite Property No. A030375				

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C			
	Type of Container	aG	aG	aG	aG	aG	aG			
	No. of Container(s)	1	1	1	1	1	1			
	Volume	1000mL	60mL	250mL	120mL	250mL	120mL			
Special Handling and/or Storage										

000020	SAMPLE ANALYSIS			See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA814-RJN 9/16/03	Semi-VOA - 8270A (TCL)			
--------	-----------------	--	--	---------------------------------------	-------------------------	---------------------------------------	---------------------	--	------------------------	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time									
J00Y84	SOIL	9-18-03	0906			X	X	X	X			
J00Y85	SOIL	9-18-03	0906			X	X	X	X			

Personnel not available to Relinquish samples from 3728 Ref # **3C** on **9/24/03**

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
<i>[Signature]</i>	9-18-03/1430	<i>[Signature]</i>	9-18-03/1430
REF 3C 3728	92403 1300	SIGALEN/ML	92403 1300
SIGALEN/ML	92403 1300	FED EX	
FED EX	9-25-03/0925	<i>[Signature]</i>	9-25-03/0925

SPECIAL INSTRUCTIONS
 If gross alpha is detected above background, then contact Joan Kessner to determine if further alpha specific analyses is needed. If gross beta is detected above background, then strontium analyses will be performed.
 (1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; 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) **RJN 9-16-03**
 (2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)
Calc. NO. 0100B-CA-VD180

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

Appendix 5

Data Validation Supporting Documentation

000021

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-B-14		DATA PACKAGE: H2354		
VALIDATOR:	TLI	LAB:	LLI	DATE:	11/12/03
CASE:			SDG:	H2354	
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	SW-846 8082	SW-846 8081 (TCLP)		
SAMPLES/MATRIX					
J00Y83 J00Y84 J00Y85					
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: NO FB

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: cell post J - MS Diluted on MSD NO PAS
toxaphen - NO LCS - J all
NO MS/MSD

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: MS/MSD diluted out in post July

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**
Results 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: pest - all over

9. SAMPLE CLEANUP (Levels D and E)

Fluorocil ® (or other absorbant) cleanup performed? Yes No **N/A**
Lot check performed? Yes No **N/A**
Check recoveries acceptable? Yes No **N/A**
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:

Lionville Laboratory Sample Discrepancy Report (SDR)

SDR #: 0306428

Initiator: John Lee
 Date: 10/7/07
 Client: TNU

Batch: 0309L564 JBS
 Samples: BS
 Method: SWB46/MCAVVW/CLPI

Parameter: PES
 Matrix: S0.1
 Prep Batch: 03LE1210

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)
Blank spike elevated 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)

Other Description:
 None TC. There is minimal impact on the
 Data. The only hit is gamma-chloride
 in 0309L564-001. Gamma-chloride is
 only elevated 5% above the upper limit.
 The matrix AC was diluted out due to the matrix.
 very 0.75

4. Project Manager Instructions...signature/date: John Lee 10/7/07

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: John Lee 10/11/07 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
<input checked="" type="checkbox"/>	Initiator	<input type="checkbox"/>	Metals: Beegle
<input checked="" type="checkbox"/>	Lab General Manager: M. Taylor	<input type="checkbox"/>	Inorganic: Perrone
<input checked="" type="checkbox"/>	Project Mgr: Stone/Johnson/Haslett	<input type="checkbox"/>	GC/LC: Kiger
<input checked="" type="checkbox"/>	Technical Mgr: Wesson/Daniels	<input type="checkbox"/>	MS: Rychlak/Layman
<input checked="" type="checkbox"/>	QA (file): Alberts	<input type="checkbox"/>	Log-in: Melnic
<input type="checkbox"/>	Data Management: Feldman	<input type="checkbox"/>	Admin: Soos
<input type="checkbox"/>	Sample Prep: Beegle/Kiger	<input type="checkbox"/>	Other: _____

000026

+

Date: 27 November 2003
 To: Bechtel Hanford Inc. (technical representative)
 From: TechLaw, Inc.
 Project: Remaining Sites Confirmation Sampling - Soil - Waste Site Evaluation for 100-B-14:2 Sanitary Sewer (100-B-14 Process and Sanitary Sewer Underground Pipelines).
 Subject: Wet Chemistry - Data Package No. H2354-LLI (SDG No. H2354)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2354-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
J00Y83	9/18/03	Soil	C	Chromium VI by 7196A
J00Y84	9/18/03	Soil	C	Chromium VI by 7196A
J00Y85	9/18/03	Soil	C	Chromium VI by 7196A

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work 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.

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 acceptable.

- **Method Blanks**

Method Blanks

Method blank analyses are performed 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. All blank results must fall below the contract required detection limit (CRQL) to be acceptable.

All method blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike & Laboratory Control Sample

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

All accuracy 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 (J00Y84/J00Y85) were submitted for analysis. Field duplicate samples 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 required quantitation limits (RQLs) to ensure that laboratory detection levels meet the required criteria. All undetected results exceeded the RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2354-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

All undetected results exceeded the RQL. Under the BHI statement of work, no qualification is required.

000003

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.

Appendix 1

Glossary of Data Reporting Qualifiers

000005

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

000007

WET CHEMISTRY DATA QUALIFICATION SUMMARY

SDG: H2354	REVIEWER: TLI	DATE: 11/27/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned.			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 09/30/03

CLIENT: TNU-HANFORD B03-015 H2354

LVL LOT #: 0309L565

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00Y83	% Solids	99.3	%	0.01	1.0
		Chromium VI	0.80 u	MG/KG	0.80	2.0
-002	J00Y84	% Solids	96.6	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-003	J00Y85	% Solids	96.7	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0

R
11/22/07

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000012



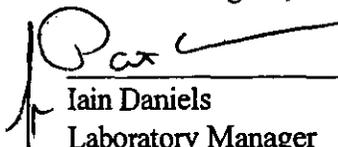
Analytical Report

Client: TNU-HANFORD B03-015 H2354
LVL#: 0309L565

W.O.#: 11343-601-001-9999-00
Date Received: 09-25-03

INORGANIC NARRATIVE

1. This narrative covers the analyses of 3 soil samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary. Elevated reporting limit associated with Chromium VI sample J00Y83 was the result of the necessity to dilute the background color present in the sample digestate.
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.
6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.
7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.
8. The replicate analyses for Percent Solids and Chromium VI were within the 20% Relative Percent Difference (RPD) control limit.
9. Results for solid samples are reported on a dry weight basis.
10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

10-2-03
Date

njpl09-565

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.

000013



Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B03-015-136 Page 1 of 1	
Collector R. Nielson/D. Bowers		Company Contact Ella Feist		Telephone No. 372-9140	Project Coordinator KESSNER, JH	Price Code 8L
Project Designation Remaining Sites Confirmation Sampling-Soil		Sampling Location 115-B Gas Recirc. Bldg. Pipelines - A14 (100-B-14)			SAF No. B03-015	Data Turnaround 21 Days 7/24/03
Ice Chest No. ERC-96009		Field Logbook No. EL-1578-1	COA C17HXB671C		Method of Shipment Federal Express	
Shipped To EDERLINE SERVICES (Formerly TMA) RECRA <i>07/24/03</i>		Offsite Property No. A030375			Bill of Lading/Air Bill No. SEE OSPC	

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C
	Type of Container	aG	aG	aG	aG	aG	aG
	No. of Container(s)	1	1	1	1	1	1
	Volume	1000mL	60mL	250mL	120mL	250mL	120mL

Special Handling and/or Storage	See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081; Chloro-Hydrocarbons - 8083 RJW 9/18/03	Semi-VOA - 8270A (TCL)
	000014					

Sample No.	Matrix *	Sample Date	Sample Time				
J00Y83	SOIL	9/18/03	0833		X	X	X

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *
Relinquished By/Removed From <i>Doug Bowers</i> 9/24/03 1300	Date/Time 9/24/03 1300	Received By/Stored In <i>R. Nielson</i> 9-18-03/1410	Date/Time 9-18-03/1410	If gross alpha is detected above background, then contact Joan Kessner to determine if further alpha specific analyses is needed. If gross beta is detected above background, then strontium analyses will be performed. (1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; 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) RJW 9-18-03 (2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) Personnel not available to Relinquish samples from 3728 Ref # 3209 9/24/03		S=Soil SE=Sediment SO=Solid SI=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WJ=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From <i>REF 3C 3728</i> 92403 1300	Date/Time 92403 1300	Received By/Stored In <i>SIGALC/John</i> 92403 1300	Date/Time 92403 1300			
Relinquished By/Removed From <i>SIGALC/John</i> 92403 1300	Date/Time 92403 1300	Received By/Stored In FED EX	Date/Time			
Relinquished By/Removed From <i>John</i> 9-25-03/0925	Date/Time 9-25-03/0925	Received By/Stored In <i>John</i> 9-25-03/0925	Date/Time 9-25-03/0925			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time			

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						B03-015-137		Page 1 of 1													
Collector R. Nielson/D. Bowers		Company Contact Ella Feist		Telephone No. 372-9140		Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround													
Project Designation Remaining Sites Confirmation Sampling-Soil		Sampling Location 115-B Gas Recirc. Bldg. Pipelines - A16 (100-B-14)				SAF No. B03-015		Air Quality <input type="checkbox"/>		21 Days 7/18/03													
Ice Chest No. ERC 02 107		Field Logbook No. EL-1578-1		COA C17HXB671C		Method of Shipment Federal Express																	
Shipped To RECRA EDERLINE SERVICES (Formerly TMA) 9/16/03		Offsite Property No. A030375				Bill of Lading/Air Bill No. SEE OSPC																	
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage			Preservation		None	None	None	Cool 4C	Cool 4C	Cool 4C													
			Type of Container		aG	aG	aG	aG	aG	aG													
			No. of Container(s)		1	1	1	1	1	1													
			Volume		1000mL	60mL	250mL	120mL	250mL	120mL													
SAMPLE ANALYSIS			See item (1) in Special Instructions.		Carbon-14; Tritium - H3	See item (2) in Special Instructions.		Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA 8161-RJA 9/16/03	Semi-VOA - 8270A (TCL)													
			Sample No.	Matrix *	Sample Date	Sample Time																	
J00Y84	SOIL	9-18-03	0906			X	X	X	X														
J00Y85	SOIL	9-18-03	0906			X	X	X	X														
										Personnel not available to Relinquish samples from 3728 Ref # 3C on 9/24/03													
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				Matrix *											
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		If gross alpha is detected above background, then contact Joan Kessner to determine if further alpha specific analyses is needed. If gross beta is detected above background, then strontium analyses will be performed. (1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; 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) RJA 9-16-03 (2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)				S=Soil SB=Soilmen 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											
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																	
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time																	
LABORATORY SECTION		Received By		Title				Date/Time															
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time															

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-15-14		DATA PACKAGE: H2354		
VALIDATOR:	TLI	LAB: LLI	DATE: 11/18/08		
CASE:			SDG: H2354		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO ₃ /NO ₂
Sulfate	TDS	TKN	Phosphate		
SAMPLES/MATRIX					
J00483 J00484 J00485					
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No **N/A**
 Comments: _____

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

Initial calibrations performed on all instruments? Yes No **N/A**
 Initial calibrations acceptable? Yes No **N/A**
 ICV and CCV checks performed on all instruments? Yes No **N/A**
 ICV and CCV checks acceptable? Yes No **N/A**
 Standards traceable? Yes No **N/A**
 Standards expired? Yes No **N/A**
 Calculation check acceptable? Yes No **N/A**

Comments: _____

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

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

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

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

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

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

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

- Duplicate RPD values acceptable? Yes No N/A
- Duplicate results acceptable? Yes No N/A
- MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
- MS/MSD standards expired? (Levels D, E) Yes No N/A
- Field duplicate RPD values acceptable? Yes No N/A
- Field split RPD values acceptable? Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A

Comments: _____

6. HOLDING TIMES (all levels)

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

Comments: _____

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

7. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

Appendix 6

Additional Documentation Requested by Client

000021

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/30/03

CLIENT: TNU-HANFORD B03-015 H2354

LVL LOT #: 0309L565

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	03LVI071-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

000022

08

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 09/30/03

CLIENT: TNU-HANFORD B03-015 H2354
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0309L565

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-003	J00Y85	Soluble Chromium VI	4.6	0.41u	4.1	106.8	1.0
		Insoluble Chromium VI	1390	0.41u	1270	109.8	100
BLANK10	03LVI071-MB1	Soluble Chromium VI	4.0	0.40u	4.0	99.1	1.0
		Insoluble Chromium VI	1060	0.40u	1110	95.5	100

000023

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 09/30/03

CLIENT: TNU-HANFORD B03-015 H2354

LVL LOT #: 0309L565

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

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J00Y83	% Solids	99.3	99.4	0.10	1.0
-003REP	J00Y85	Chromium VI	0.41u	0.41u	NC	1.0

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Date: 27 November 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site Evaluation for 100-B-14:2 Sanitary Sewer (100-B-14 Process and Sanitary Sewer Underground Pipelines).
Subject: Semivolatiles - Data Package No. H2354-LLI (SDG No. H2354)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2354-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	Media	Validation	Waste Site	Analysis
J00Y83	9/18/03	Soil	C	100-B-14	See note 1
J00Y84	9/18/03	Soil	C	100-B-14	See note 1
J00Y85	9/18/03	Soil	C	100-B-14	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 Data Quality Objectives Summary Report for 100/300 Area Remaining Sites Analytical Sampling Effort, (BHI-01249, Rev. 3, March 2003). Appendices 1 through 5 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

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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, 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

No field blanks were submitted for analysis.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate & Blank Spike 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.

All accuracy results were acceptable.

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.

All MS/MSD RPD results were acceptable.

Field Duplicate Samples

One set of field duplicate samples (J00Y84/J00Y85) were submitted for analysis. Field duplicates are compared based on the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

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- **Analytical Detection Levels**

Reported analytical detection levels are compared against the required quantitation limits (RQL's) to ensure that laboratory detection levels meet the required criteria. All undetected analytes exceeded the RQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H2354-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

All undetected analytes exceeded the RQL. 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.

Appendix 1
Glossary of Data Reporting Qualifiers

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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

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SEMIVOLATILE DATA QUALIFICATION SUMMARY

SDG: H2354	REVIEWER: TLI	DATE: 11/27/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned.			

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: BECHTEL-HANFORD													
Laboratory: LLI													
Case:		SDG: H2354											
Sample Number		J00Y83		J00Y84		J00Y85							
Remarks						Duplicate							
Sample Date		9/18/03		9/18/03		9/18/03							
Extraction Date		9/30/03		9/30/03		9/30/03							
Analysis Date		10/1/03		10/1/03		10/1/03							
Semivolatile (8270C)	RDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	660	670	U	690	U	690	U						
bis(2-Chloroethyl)ether	660	670	U	690	U	690	U						
2-Chlorophenol	660	670	U	690	U	690	U						
1,3-Dichlorobenzene	660	670	U	690	U	690	U						
1,4-Dichlorobenzene	660	670	U	690	U	690	U						
1,2-Dichlorobenzene	660	670	U	690	U	690	U						
2-Methylphenol	660	670	U	690	U	690	U						
2,2'-oxybis(1-chloropropane)	660	670	U	690	U	690	U						
3 and/or 4-Methylphenol	660	670	U	690	U	690	U						
N-Nitroso-di-n-propylamine	660	670	U	690	U	690	U						
Hexachloroethane	660	670	U	690	U	690	U						
Nitrobenzene	660	670	U	690	U	690	U						
Isophorone	660	670	U	690	U	690	U						
2-Nitrophenol	660	670	U	690	U	690	U						
2,4-Dimethylphenol	660	670	U	690	U	690	U						
bis(2-Chloroethoxy)methane	660	670	U	690	U	690	U						
2,4-Dichlorophenol	660	670	U	690	U	690	U						
1,2,4-Trichlorobenzene	660	670	U	690	U	690	U						
Naphthalene	660	670	U	690	U	690	U						
4-Chloroaniline	660	670	U	690	U	690	U						
Hexachlorobutadiene	660	670	U	690	U	690	U						
4-Chloro-3-methylphenol	660	670	U	690	U	690	U						
2-Methylnaphthalene	660	670	U	690	U	690	U						
Hexachlorocyclopentadiene	660	670	U	690	U	690	U						
2,4,6-Trichlorophenol	660	670	U	690	U	690	U						
2,4,5-Trichlorophenol	660	1700	U	1700	U	1700	U						
2-Chloronaphthalene	660	670	U	690	U	690	U						
2-Nitroaniline	660	1700	U	1700	U	1700	U						
Dimethylphthalate	660	670	U	690	U	690	U						
Acenaphthylene	660	670	U	690	U	690	U						
2,6-Dinitrotoluene	660	670	U	690	U	690	U						

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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.

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Project: BECHTEL-HANFORD													
Laboratory: LLI													
Case:		SDG: H2354											
Sample Number		J00Y83		J00Y84		J00Y85							
Remarks		Duplicate											
Sample Date		9/18/03		9/18/03		9/18/03							
Extraction Date		9/30/03		9/30/03		9/30/03							
Analysis Date		10/1/03		10/1/03		10/1/03							
Semivolatile (8270C)	RDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	660	1700	U	1700	U	1700	U						
Acenaphthene	660	670	U	690	U	690	U						
2,4-Dinitrophenol	660	1700	U	1700	U	1700	U						
4-Nitrophenol	660	1700	U	1700	U	1700	U						
Dibenzofuran	660	670	U	690	U	690	U						
2,4-Dinitrotoluene	660	670	U	690	U	690	U						
Diethylphthalate	660	670	U	690	U	690	U						
4-Chlorophenyl-phenyl ether	660	670	U	690	U	690	U						
Fluorene	660	670	U	690	U	690	U						
4-Nitroaniline	660	1700	U	1700	U	1700	U						
4,6-Dinitro-2-methylphenol	660	1700	U	1700	U	1700	U						
N-Nitrosodiphenylamine	660	670	U	690	U	690	U						
4-Bromophenyl-phenyl ether	660	670	U	690	U	690	U						
Hexachlorobenzene	660	670	U	690	U	690	U						
Pentachlorophenol	660	1700	U	1700	U	1700	U						
Phenanthrene	660	670	U	690	U	690	U						
Anthracene	660	670	U	690	U	690	U						
Carbazole	660	670	U	690	U	690	U						
Di-n-butylphthalate	660	670	U	690	U	690	U						
Fluoranthene	660	670	U	210		47							
Pyrene	660	670	U	150		35							
Butylbenzylphthalate	660	670	U	690	U	690	U						
3,3'-Dichlorobenzidine	660	670	U	690	U	690	U						
Benzo(a)anthracene	660	670	U	110		690	U						
Chrysene	660	670	U	120		690	U						
bis(2-Ethylhexyl)phthalate	660	670	U	690	U	690	U						
Di-n-octylphthalate	660	670	U	690	U	690	U						
Benzo(b)fluoranthene	660	670	U	92		690	U						
Benzo(k)fluoranthene	660	670	U	80		690	U						
Benzo(a)pyrene	660	670	U	81		690	U						
Indeno(1,2,3-cd)pyrene	660	670	U	35		690	U						
Dibenz(a,h)anthracene	660	670	U	690	U	690	U						
Benzo(g,h,i)perylene	660	670	U	39		690	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.

Semivolatiles by GC/MS, HSL List

Report Date: 10/02/03 11:50

RFW Batch Number: 0309L565

Client: TNUHANFORD B03-015 H2354

Work Order: 11343606001

Page: 1a

Cust ID:	J00Y83	J00Y83	J00Y83	J00Y84	J00Y85	SBLKCS	
Sample Information	RFW#: 001	001 MS	001 MSD	002	003	03LE1228-MB1	
	Matrix: SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
	D.F.: 2.00	2.00	2.00	2.00	2.00	1.00	
	Units: ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	ug/Kg	
Surrogate	Nitrobenzene-d5	54 %	69 %	63 %	62 %	62 %	28 %
Recovery	2-Fluorobiphenyl	62 %	72 %	67 %	60 %	65 %	26 * %
	Terphenyl-d14	66 %	78 %	66 %	65 %	70 %	40 %
	Phenol-d5	63 %	77 %	73 %	64 %	70 %	30 %
	2-Fluorophenol	68 %	78 %	79 %	68 %	74 %	34 %
	2,4,6-Tribromophenol	67 %	79 %	70 %	65 %	73 %	31 %
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	Phenol	670 U	73 %	72 %	690 U	690 U	330 U
	bis(2-Chloroethyl) ether	670 U	670 U	670 U	690 U	690 U	330 U
	2-Chlorophenol	670 U	72 %	73 %	690 U	690 U	330 U
	1,3-Dichlorobenzene	670 U	670 U	670 U	690 U	690 U	330 U
	1,4-Dichlorobenzene	670 U	63 %	64 %	690 U	690 U	330 U
	1,2-Dichlorobenzene	670 U	670 U	670 U	690 U	690 U	330 U
	2-Methylphenol	670 U	670 U	670 U	690 U	690 U	330 U
	2,2'-oxybis(1-Chloropropane)	670 U	670 U	670 U	690 U	690 U	330 U
	3- and/or 4-Methylphenol	670 U	670 U	670 U	690 U	690 U	330 U
	N-Nitroso-di-n-propylamine	670 U	61 %	67 %	690 U	690 U	330 U
	Hexachloroethane	670 U	670 U	670 U	690 U	690 U	330 U
	Nitrobenzene	670 U	670 U	670 U	690 U	690 U	330 U
	Isophorone	670 U	670 U	670 U	690 U	690 U	330 U
	2-Nitrophenol	670 U	670 U	670 U	690 U	690 U	330 U
	2,4-Dimethylphenol	670 U	670 U	670 U	690 U	690 U	330 U
	bis(2-Chloroethoxy) methane	670 U	670 U	670 U	690 U	690 U	330 U
	2,4-Dichlorophenol	670 U	670 U	670 U	690 U	690 U	330 U
	1,2,4-Trichlorobenzene	670 U	66 %	63 %	690 U	690 U	330 U
	Naphthalene	670 U	670 U	670 U	690 U	690 U	330 U
	4-Chloroaniline	670 U	670 U	670 U	690 U	690 U	330 U
	Hexachlorobutadiene	670 U	670 U	670 U	690 U	690 U	330 U
	4-Chloro-3-methylphenol	670 U	85 %	84 %	690 U	690 U	330 U
	2-Methylnaphthalene	670 U	670 U	670 U	690 U	690 U	330 U
	Hexachlorocyclopentadiene	670 U	670 U	670 U	690 U	690 U	330 U
	2,4,6-Trichlorophenol	670 U	670 U	670 U	690 U	690 U	330 U
	2,4,5-Trichlorophenol	1700 U	1700 U	1700 U	1700 U	1700 U	830 U

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*= Outside of EPA CLP QC limits.

Cust ID: J00Y83 J00Y83 J00Y83 J00Y84 J00Y85 SBLKCS
 RFW#: 001 001 MS 001 MSD 002 003 03LE1228-MB1

	001	001 MS	001 MSD	002	003	03LE1228-MB1
2-Chloronaphthalene	670 U	670 U	670 U	690 U	690 U	330 U
2-Nitroaniline	1700 U	1700 U	1700 U	1700 U	1700 U	830 U
Dimethylphthalate	670 U	670 U	670 U	690 U	690 U	330 U
Acenaphthylene	670 U	670 U	670 U	690 U	690 U	330 U
2,6-Dinitrotoluene	670 U	670 U	670 U	690 U	690 U	330 U
3-Nitroaniline	1700 U	1700 U	1700 U	1700 U	1700 U	830 U
Acenaphthene	670 U	74 %	69 %	690 U	690 U	330 U
2,4-Dinitrophenol	1700 U	1700 U	1700 U	1700 U	1700 U	830 U
4-Nitrophenol	1700 U	78 %	84 %	1700 U	1700 U	830 U
Dibenzofuran	670 U	670 U	670 U	690 U	690 U	330 U
2,4-Dinitrotoluene	670 U	76 %	74 %	690 U	690 U	330 U
Diethylphthalate	670 U	670 U	670 U	690 U	690 U	330 U
4-Chlorophenyl-phenylether	670 U	670 U	670 U	690 U	690 U	330 U
Fluorene	670 U	670 U	670 U	690 U	690 U	330 U
4-Nitroaniline	1700 U	1700 U	1700 U	1700 U	1700 U	830 U
4,6-Dinitro-2-methylphenol	1700 U	1700 U	1700 U	1700 U	1700 U	830 U
N-Nitrosodiphenylamine (1)	670 U	670 U	670 U	690 U	690 U	330 U
4-Bromophenyl-phenylether	670 U	670 U	670 U	690 U	690 U	330 U
Hexachlorobenzene	670 U	670 U	670 U	690 U	690 U	330 U
Pentachlorophenol	1700 U	69 %	66 %	1700 U	1700 U	830 U
Phenanthrene	670 U	670 U	670 U	690 U	690 U	330 U
Anthracene	670 U	670 U	670 U	690 U	690 U	330 U
Carbazole	670 U	670 U	670 U	690 U	690 U	330 U
Di-n-butylphthalate	670 U	670 U	670 U	690 U	690 U	330 U
Fluoranthene	670 U	670 U	670 U	210 J	47 J	330 U
Pyrene	670 U	72 %	67 %	150 J	35 J	330 U
Butylbenzylphthalate	670 U	670 U	670 U	690 U	690 U	330 U
3,3'-Dichlorobenzidine	670 U	670 U	670 U	690 U	690 U	330 U
Benzo(a)anthracene	670 U	670 U	670 U	110 J	690 U	330 U
Chrysene	670 U	670 U	670 U	120 J	690 U	330 U
bis(2-Ethylhexyl)phthalate	670 U	65 J	59 J	690 U	690 U	330 U
Di-n-octyl phthalate	670 U	670 U	670 U	690 U	690 U	330 U
Benzo(b)fluoranthene	670 U	670 U	670 U	92 J	690 U	330 U
Benzo(k)fluoranthene	670 U	670 U	670 U	80 J	690 U	330 U
Benzo(a)pyrene	670 U	670 U	670 U	81 J	690 U	330 U
Indeno(1,2,3-cd)pyrene	670 U	670 U	670 U	35 J	690 U	330 U
Dibenz(a,h)anthracene	670 U	670 U	670 U	690 U	690 U	330 U
Benzo(g,h,i)perylene	670 U	670 U	670 U	39 J	690 U	330 U

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

Lionville Laboratory, Inc.

Semivolatiles by GC/MS, HSL List

Report Date: 10/02/03 11:50

RFW Batch Number: 0309L565

Client: TNUHANFORD B03-015 H2354

Work Order: 11343606001

Page: 2a

Cust ID: SBLKCS BS

Sample Information RFW#: 03LE1228-MB1
 Matrix: SOIL
 D.F.: 1.00
 Units: ug/Kg

	Nitrobenzene-d5	47	%
Surrogate	2-Fluorobiphenyl	45	%
Recovery	Terphenyl-d14	55	%
	Phenol-d5	52	%
	2-Fluorophenol	54	%
	2,4,6-Tribromophenol	48	%
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	Phenol	51	%
	bis(2-Chloroethyl)ether	330	U
	2-Chlorophenol	51	%
	1,3-Dichlorobenzene	330	U
	1,4-Dichlorobenzene	46	%
	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	44	%
	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	45	%
	Naphthalene	330	U
	4-Chloroaniline	330	U
	Hexachlorobutadiene	330	U
	4-Chloro-3-methylphenol	56	%
	2-Methylnaphthalene	330	U
	Hexachlorocyclopentadiene	330	U
	2,4,6-Trichlorophenol	330	U
	2,4,5-Trichlorophenol	830	U

*= Outside of EPA CLP QC limits.

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Cust ID: SBLKCS BS

RFW#: 03LE1228-MB1

2-Chloronaphthalene	330	U
2-Nitroaniline	830	U
Dimethylphthalate	330	U
Acenaphthylene	330	U
2,6-Dinitrotoluene	330	U
3-Nitroaniline	830	U
Acenaphthene	46	%
2,4-Dinitrophenol	830	U
4-Nitrophenol	58	%
Dibenzofuran	330	U
2,4-Dinitrotoluene	51	%
Diethylphthalate	330	U
4-Chlorophenyl-phenylether	330	U
Fluorene	330	U
4-Nitroaniline	830	U
4,6-Dinitro-2-methylphenol	830	U
N-Nitrosodiphenylamine (1)	330	U
4-Bromophenyl-phenylether	330	U
Hexachlorobenzene	330	U
Pentachlorophenol	53	%
Phenanthrene	330	U
Anthracene	330	U
Carbazole	330	U
Di-n-butylphthalate	330	U
Fluoranthene	330	U
Pyrene	52	%
Butylbenzylphthalate	330	U
3,3'-Dichlorobenzidine	330	U
Benzo (a) anthracene	330	U
Chrysene	330	U
bis (2-Ethylhexyl) phthalate	330	U
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

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 11/22/05

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

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Client: TNU-HANFORD B03-015
LVL #: 0309L565
SDG/SAF # H2354/B03-015

W.O. #: 11343-606-001-9999-00
Date Received: 09-25-2003

SEMIVOLATILE

Three (3) soil samples were collected on 09-18-2003.

The samples and their associated QC samples were extracted according to Lionville Laboratory OPs based on method 3550 on 09-30-2003 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for client specified Semivolatile target compounds on 10-01-2003.

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. All samples required a 2-fold dilution due to the nature of the sample matrix and high levels of non-target compounds.
5. One (1) of forty-two (42) surrogate recoveries was 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 the method blank. 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

10-6-03
Date

som\group\data\bna\tnu-hanford-0309-565.doc

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.

000017

02

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			B03-015-136 Page 1 of 1	
Collector R. Nielson/D. Bowers	Company Contact Ella Feist	Telephone No. 372-9140	Project Coordinator KESSNER, JH		Price Code 8L	Data Turnaround
Project Designation Remaining Sites Confirmation Sampling-Soil		Sampling Location 115-B Gas Recirc. Bldg. Pipelines - A14 (100-B-14)		SAF No. B03-015	Air Quality <input type="checkbox"/>	21 Days 7 05/29/03
Ice Chest No. ERC-96009	Field Logbook No. EL-1578-1	COA C17HXB671C		Method of Shipment Federal Express		
Shipped To EBERLINE SERVICES (Formerly TMA) RECRA		Offsite Property No. A030375		Bill of Lading/Air Bill No. SEE OSPC		

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C					
	Type of Container	aG	aG	aG	aG	aG	aG					
	No. of Container(s)	1	1	1	1	1	1					
	Volume	1000mL	60mL	250mL	120mL	250mL	120mL					
Special Handling and/or Storage		See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081; @Horo- Herbicides - EPA 815- RJP 9/18/03	Semi-VOA - 8270A (TCL)					
	000018	SAMPLE ANALYSIS										
Sample No.	Matrix *	Sample Date	Sample Time									
J00Y83	SOIL	9/18/03	0833		X	X	X	X				

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS		Matrix *
Relinquished By/Removed From <i>Doug Bowers</i>	Date/Time 9/18/03 1430	Received By/Stored In <i>Joan Kessner</i>	Date/Time 9/18/03 1430	If gross alpha is detected above background, then contact Joan Kessner to determine if further alpha specific analyses is needed. If gross beta is detected above background, then strontium analyses will be performed. (1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-89,90 - Total Str- Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238); RNP 18-03 (2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV) Personnel not available to Relinquish samples from 3728 Ref # <i>3con 9/24/03</i>		S=Soil SE=Sediment SO=Solid SI=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WI=Wipe L=Liquid V=Vegetation X=Other
Relinquished By/Removed From <i>REF 3C 3728</i>	Date/Time 9/24/03 1300	Received By/Stored In <i>SIGALC/DEL</i>	Date/Time 9/24/03 1300			
Relinquished By/Removed From <i>SIGALC/DEL</i>	Date/Time 9/24/03 1300	Received By/Stored In <i>FED EX</i>	Date/Time			
Relinquished By/Removed From <i>Chad Ex</i>	Date/Time 9/25/03 1025	Received By/Stored In <i>Chad Ex</i>	Date/Time 9/25/03 1025			
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time			

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						B03-015-137		Page 1 of 1	
Collector R. Nielson/D. Bowers		Company Contact Ella Feist		Telephone No. 372-9140		Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround 21 Days 7/10/03 92403	
Project Designation Remaining Sites Confirmation Sampling-Soil		Sampling Location 115-B Gas Recirc. Bldg. Pipelines - A16 (100-B-14)				SAF No. B03-015		Air Quality <input type="checkbox"/>			
Ice Chest No. ERC 02 107		Field Logbook No. EL-1578-1		COA C17HXB671C		Method of Shipment Federal Express					
Shipped To RECRA EDERLINE SERVICES (Formerly TMA) 9/14/03		Offsite Property No. A030375				Bill of Lading/Air Bill No. SEE OSPC					
POSSIBLE SAMPLE HAZARDS/REMARKS			Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C		
Special Handling and/or Storage			Type of Container	aG	aG	aG	aG	aG	aG		
			No. of Container(s)	1	1	1	1	1	1		
			Volume	1000mL	60mL	250mL	120mL	250mL	120mL		
SAMPLE ANALYSIS			See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8161-RJN 9/16/03	Semi-VOA - 8270A (TCL)			
			Sample No.	Matrix *	Sample Date	Sample Time					
J00Y84	SOIL	9-18-03	0906		X	X	X	X			
J00Y85	SOIL	9-18-03	0906		X	X	X	X			
										Personnel not available to Relinquish samples from 3728 Ref # 3C on 9/24/03	
CHAIN OF POSSESSION			Sign/Print Names			SPECIAL INSTRUCTIONS					Matrix *
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time	<p>If gross alpha is detected above background, then contact Joan Kessner to determine if further alpha specific analyses is needed. If gross beta is detected above background, then strontium analyses will be performed.</p> <p>(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; 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) N/A 9-16-03</p> <p>(2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)</p>					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 Ve=Vegetation X=Other
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time						
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time						
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time						
Relinquished By/Removed From		Date/Time	Received By/Stored In		Date/Time						
LABORATORY SECTION		Received By	Title			Date/Time					
FINAL SAMPLE DISPOSITION		Disposal Method	Disposed By			Date/Time					

Appendix 5

Data Validation Supporting Documentation

000020

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-B-14		DATA PACKAGE: H2354		
VALIDATOR:	TLI	LAB:	LLI	DATE: 11/20/03	
CASE:			SDG:	H2354	
ANALYSES PERFORMED					
SW-846 8260		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX					
J00483 J00484 J00485					
Said					

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: NO 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

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: _____

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 analyses? Yes No N/A
Results 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: all undetected over

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: 27 November 2003
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site Evaluation for 100-B-14:2 Sanitary Sewer (100-B-14 Process and Sanitary Sewer Underground Pipelines).
Subject: Radiochemistry - Data Package No. H2354-LLI (SDG No. H2354)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H2354-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
J00Y83	9/18/03	Soil	C	See note 1
J00Y84	9/18/03	Soil	S	See note 1 & 2
J00Y85	9/18/03	Soil	C	See note 1 & 2

1- Gamma spectroscopy, gross alpha, gross beta, carbon-14, tritium.

2 - Total strontium.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work 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

000001

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

No field blanks were submitted for analysis.

- **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 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

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

000002

All other accuracy results were acceptable.

- **Laboratory Duplicates**

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

Due to an RPD outside QC limits ($< 2X$ RQL), all radium-228 results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate

One set of field duplicate samples (J00Y84/J00Y85) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. Six analytes were reported above their RQL. Under the BHI statement of work, no qualification is required. All other reported results met the analyte specific RQL.

- **Completeness**

Data package No. H2354 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%.

000003

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a matrix spike analysis, all carbon-14 results were qualified as estimates and flagged "J". Due to an RPD outside QC limits ($> 2X$ RQL), all radium-228 results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Six analytes were reported above their RQL. 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.

000004

Appendix 1
Glossary of Data Reporting Qualifiers

000005

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.

000006

Appendix 2

Summary of Data Qualification

000007

RADIOCHEMICAL DATA QUALIFICATION SUMMARY

SDG: H2354	REVIEWER: TLI	DATE: 11/27/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Carbon-14	J	All	No MS analysis
Radium-228	J	All	RPD

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: BECHTEL-HANFORD																					
Laboratory: EB																					
Case		SDG: H2364																			
Sample Number		J00Y83				J00Y84				J00Y85											
Remarks										Duplicate											
Sample Date		9/18/03				9/18/03				9/18/03											
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha		6.47	U	7.39		9.71															
Gross Beta		16.5		91.8		110															
Tritium		0.147	U	0.046	U	0.017	U														
Carbon-14		-1.02	UJ	0.365	UJ	-0.035	UJ														
Total strontium		NA		2.47		2.66															
Potassium-40		10.7		7.61		10.1															
Cobalt 60	0.05		U	0.427	U*	0.506															
Cesium 137	0.05	0.150		41.0		46.8															
Radium-226		0.402		U	U	0.365															
Radium-228		0.377	J	0.611	J	0.481	J														
Europium 152	0.1		U	4.40	U*	5.57															
Europium 154	0.1		U	0.454	U*	0.588															
Europium 156	0.1		U	U*	U*	U*															
Thorium-228		0.473		0.384		0.462															
Thorium-232		0.377		0.611		0.481															
Uranium-235(gea)			U	U	U	U															
Uranium-238(gea)			U	U	U	U															
Americium-241(gea)			U	U	U	U															

000010

* - RQL exceeded

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

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2354

R309132-01

J00Y83

DATA SHEET

SDG <u>7599</u>	Client/Case no <u>Hanford</u>	SDG <u>H2354</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309132-01</u>	Client sample id <u>J00Y83</u>	
Dept sample id <u>7599-001</u>	Location/Matrix <u>115-B Gas Recirc. Bldg. SOLID</u>	
Received <u>09/25/03</u>	Collected/Weight <u>09/18/03 08:33 1388 g</u>	
% solids <u>98.6</u>	Custody/SAF No <u>B03-015-136 B03-015</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	6.47	3.1	2.4	10		93A
Gross Beta	12587-47-2	16.5	4.3	5.7	15		93B
Tritium	10028-17-8	0.147	0.15	0.24	400	U	H
Carbon 14	14762-75-5	-1.02	1.7	2.8	50	U J	C
Potassium 40	13966-00-2	10.7	1.1	0.51			GAM
Cobalt 60	10198-40-0	U		<u>0.057</u>	0.050	U	GAM
Cesium 137	10045-97-3	0.150	0.063	0.058	0.10		GAM
Radium 226	13982-63-3	0.402	0.10	0.10			GAM
Radium 228	15262-20-1	0.377	0.25	0.27		J	GAM
Europium 152	14683-23-9	U		<u>0.13</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.15</u>	0.10	U	GAM
Europium 155	14391-16-3	U		<u>0.13</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.473	0.061	0.059			GAM
Thorium 232	TH-232	0.377	0.25	0.27			GAM
Uranium 235	15117-96-1	U		0.17		U	GAM
Uranium 238	U-238	U		6.6		U	GAM
Americium 241	14596-10-2	U		0.12		U	GAM

Confirmation Sampling - Soil

W
11/22/03

000011

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/16/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2354

R309132-02

J00Y84

DATA SHEET

SDG <u>7599</u>	Client/Case no <u>Hanford</u>	SDG <u>H2354</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309132-02</u>	Client sample id <u>J00Y84</u>	
Dept sample id <u>7599-002</u>	Location/Matrix <u>115-B Gas Recirc. Bldg.</u>	<u>SOLID</u>
Received <u>09/25/03</u>	Collected/Weight <u>09/18/03 09:06</u>	<u>1461 g</u>
% solids <u>96.9</u>	Custody/SAF No <u>B03-015-137</u>	<u>B03-015</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	7.39	3.7	4.0	10		93A
Gross Beta	12587-47-2	91.8	7.4	6.3	15		93B
Tritium	10028-17-8	0.046	0.13	0.22	400	U	H
Carbon 14	14762-75-5	0.365	1.8	2.9	50	U J	C
Total Strontium	SR-RAD	2.47	0.28	0.22	1.0		SR
Potassium 40	13966-00-2	7.61	1.3	0.78			GAM
Cobalt 60	10198-40-0	0.427	0.10	<u>0.092</u>	0.050		GAM
Cesium 137	10045-97-3	41.0	0.62	<u>0.23</u>	0.10		GAM
Radium 226	13982-63-3	U		0.43		U	GAM
Radium 228	15262-20-1	0.611	0.46	0.51		J	GAM
Europium 152	14683-23-9	4.40	0.60	<u>0.75</u>	0.10		GAM
Europium 154	15585-10-1	0.454	0.30	<u>0.33</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>0.49</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.384	0.22	0.30			GAM
Thorium 232	TH-232	0.611	0.46	0.51			GAM
Uranium 235	15117-96-1	U		0.65		U	GAM
Uranium 238	U-238	U		13		U	GAM
Americium 241	14596-10-2	U		0.99		U	GAM

Confirmation Sampling - Soil

Handwritten: 11/22/03

DATA SHEETS

Page 2

SUMMARY DATA SECTION

Page 16

000012

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/16/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2354

R309132-03

J00Y85

DATA SHEET

SDG <u>7599</u>	Client/Case no <u>Hanford</u>	SDG <u>H2354</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309132-03</u>	Client sample id <u>J00Y85</u>	
Dept sample id <u>7599-003</u>	Location/Matrix <u>115-B Gas Recirc. Bldg. SOLID</u>	
Received <u>09/25/03</u>	Collected/Weight <u>09/18/03 09:06 1416 g</u>	
% solids <u>96.6</u>	Custody/SAF No <u>B03-015-137 B03-015</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	9.71	4.0	3.3	10		93A
Gross Beta	12587-47-2	110	8.2	7.2	15		93B
Tritium	10028-17-8	0.017	0.14	0.23	400	U	H
Carbon 14	14762-75-5	-0.035	1.6	2.7	50	U J	C
Total Strontium	SR-RAD	2.66	0.28	0.20	1.0		SR
Potassium 40	13966-00-2	10.1	0.74	0.38			GAM
Cobalt 60	10198-40-0	0.506	0.072	0.050	0.050		GAM
Cesium 137	10045-97-3	46.8	0.34	0.11	0.10		GAM
Radium 226	13982-63-3	0.365	0.14	0.18			GAM
Radium 228	15262-20-1	0.481	0.22	0.26		J	GAM
Europium 152	14683-23-9	5.57	0.37	0.42	0.10		GAM
Europium 154	15585-10-1	0.588	0.15	0.16	0.10		GAM
Europium 155	14391-16-3	U		0.27	0.10	U	GAM
Thorium 228	14274-82-9	0.462	0.10	0.15			GAM
Thorium 232	TH-232	0.481	0.22	0.26			GAM
Uranium 235	15117-96-1	U		0.35		U	GAM
Uranium 238	U-238	U		8.6		U	GAM
Americium 241	14596-10-2	U		0.46		U	GAM

Confirmation Sampling - Soil

K
11/22/03

000013

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/16/03</u>

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000014

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H2354 was composed of three soil samples designated under SAF No. B03-015 with a Project Designation of: Remaining Sites Confirmation Sampling - Soil.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on October 3, and 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 Tritium Analyses

No problems were encountered during the course of the analyses.

2.3 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.4 Total Strontium Analyses

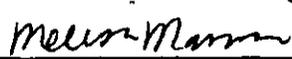
BHI requested total Sr analysis on samples J00Y84 and J00Y85 on October 6, 2003. No problems were encountered during the course of the analyses.

2.5 Gamma Spectroscopy Analyses

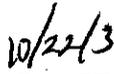
No problems were encountered during the course of the analyses.

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 C. Mannion
Senior Program Manager



Date

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					B03-015-136		Page 1 of 1				
Collector R. Nielson/D. Bowers		Company Contact Ella Feist		Telephone No. 372-9140		Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround			
Project Designation Remaining Sites Confirmation Sampling-Soil		Sampling Location 115-B Gas Recirc. Bldg. Pipelines - A14 (100-B-14)			H2354 (7599)		SAF No. B03-015		Air Quality <input type="checkbox"/>		21 Days 7/1/03		
Ice Chest No. ERC 02 003		Field Logbook No. EL-1578-1		COA C17HXB671C		Method of Shipment Federal Express							
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. A030 367			Bill of Lading/Air Bill No. SEE OSPC								
POSSIBLE SAMPLE HAZARDS/REMARKS Special Handling and/or Storage				Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C			
				Type of Container	aG	aG	aG	aG	aG	aG			
				No. of Container(s)	1	1	1	1	1	1			
				Volume	100mL	60mL	250mL	120mL	250mL	120mL			
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA8151	Semi-VOA - 8270A (TCL)				
				Sample No.	Matrix *	Sample Date	Sample Time						
000016		00Y83	SOIL	9/18/03	0833	X	X						
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS									
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		<p>If gross alpha is detected above background, then contact Joan Kessner to determine if further alpha specific analyses is needed. If gross beta is detected above background, then strontium analyses will be performed.</p> <p>(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238; Plutonium-239/240); Strontium-90,90 - Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238)</p> <p>(2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)</p> <p>Personnel not available to relinquish samples from 3728 Ref # 3C on 9/24/03</p>					
D. Bowers		9/18/03 1300		R. J. 3728		9-18-03/1478							
REF 3C 3728		92403 1300		S. Gale		92403 1300							
S. Gale		9/24/03 1300		FED EX									
FED EX		9/25/03		J. Bowers		9/25/03 12:30							
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		<p>Matrix</p> <p>S=Soil SE=Sediment SO=Solid SL=Sludge W=Water O=Oil A=Air DS=Drum Solids DL=Drum Liquids T=Tissue WT=Wipe L=Liquid V=Vegetation X=Other</p>					
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time							
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					B03-015-137		Page 1 of 1			
Collector R. Nielson/D. Bowers		Company Contact Ella Feist		Telephone No. 372-9140		Project Coordinator KESSNER, JH		Price Code 8L		Data Turnaround		
Project Designation Remaining Sites Confirmation Sampling-Soil		Sampling Location 115-B Gas Recirc. Bldg. Pipelines - A16 (100-B-14)			H2354 (7599)		SAF No. B03-015		Air Quality <input type="checkbox"/>		21 Days 7 DAY 9/19/03	
Ice Chest No. ERC02 003		Field Logbook No. EL-1578-1		COA C17HXB671C		Method of Shipment Federal Express						
Shipped To EBERLINE SERVICES (Formerly TMA)		Offsite Property No. A030367			Bill of Lading/Air Bill No. SEE OSPC							
POSSIBLE SAMPLE HAZARDS/REMARKS				Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C		
Special Handling and/or Storage				Type of Container	aG	aG	aG	aG	aG	aG		
				No. of Container(s)	1	1	1	1	1	1		
				Volume	1000mL	60mL	250mL	120mL	250mL	120mL		
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Carbon-14; Tritium - H3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081; Chloro-Herbicides - EPA 8161-RJW 9/16/03	Semi-VOA - 8270A (TCL)			
Sample No.	Matrix *	Sample Date	Sample Time									
J00Y84	SOIL	9/18/03	0906	X	X							
J00Y85	SOIL	9/18/03	0906	X	X							
										Personnel not available to relinquish samples from 3728 Ref # 2 on 9/24/03		
CHAIN OF POSSESSION				Sign/Print Names				SPECIAL INSTRUCTIONS				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		<p>If gross alpha is detected above background, then contact Joan Kessner to determine if further alpha specific analyses is needed. If gross beta is detected above background, then strontium analyses will be performed.</p> <p>(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; 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) RJW 9-16-03</p> <p>(2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)</p> <p>Calc. No. 0100B-CA-V0180</p>				
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time						
Relinquished By/Removed From		Date/Time		Received By/Stored In		Date/Time		Matrix *				
LABORATORY SECTION		Received By		Title				Date/Time				
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time				

Appendix 5

Data Validation Supporting Documentation

000018

Appendix A – Radiochemical Data Validation Checklist

Standards Expired?Yes No N/A

Calculation check acceptable?Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E).....~~Yes~~ 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).....~~Yes~~ 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: _____

Appendix A – Radiochemical Data Validation Checklist

- 5. Blanks (Levels B, C, D, E) N/A
- Method blank analyzed within required frequency? Yes No N/A *W/Notes*
- Method blank results acceptable? Yes No N/A
- Analytes detected in method blank? Yes No N/A
- Field blank(s) analyzed? Yes No N/A
- Field blank results acceptable? Yes No N/A
- Analytes detected in field blank(s)? Yes No N/A
- Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: NO FB

- 6. Laboratory Control Samples or Blank Spike Samples (Levels C, D, E) N/A
- LCS /BSS analyzed within required frequency? Yes No N/A
- LCS/BSS recoveries acceptable? Yes No N/A
- LCS/BSS traceable? (Levels D,E) Yes No N/A
- LCS/BSS expired? (Levels D,E) Yes No N/A
- LCS/BSS levels correct? (Levels D,E) Yes No N/A
- Transcription/Calculation Errors? (Levels D, E) Yes No N/A

Comments: _____

- 7. Chemical Carrier Recovery (Levels C, D, E) N/A
- Chemical carrier added? Yes No N/A
- Chemical recovery acceptable? Yes No N/A
- Chemical carrier traceable? (Levels D, E) Yes No N/A

Appendix A – Radiochemical Data Validation Checklist

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

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

Comments: _____

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

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

Tracer recovery acceptable? Yes No N/A

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

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

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

Comments: _____

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

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

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

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

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

Comments: NO C14 MS

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: Ra 228 - 72x RAL - J all

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

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

Field duplicate RPD values acceptable? Yes No N/A

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

Field split RPD values acceptable? Yes No N/A

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

Performance audit sample results acceptable? Yes No N/A

Comments: NO FS or PAF

12. Holding Times (All levels)

Are sample holding times acceptable? Yes No N/A

Comments: _____

Appendix A – Radiochemical Data Validation Checklist

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: 6 over

Appendix 6

Additional Documentation Requested by Client

000025

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2354

R309132-05

Method Blank

METHOD BLANK

SDG <u>7599</u>	Client/Case no <u>Hanford</u>	SDG <u>H2354</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309132-05</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7599-005</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B03-015</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	-0.406	1.2	2.8	10	U	93A
Gross Beta	12587-47-2	2.14	4.3	7.1	15	U	93B
Tritium	10028-17-8	0.176	0.15	0.24	400	U	H
Carbon 14	14762-75-5	0.458	1.8	3.0	50	U	C
Potassium 40	13966-00-2	U		0.41		U	GAM
Cobalt 60	10198-40-0	U		0.030	0.050	U	GAM
Cesium 137	10045-97-3	U		0.030	0.10	U	GAM
Radium 226	13982-63-3	U		0.058		U	GAM
Radium 228	15262-20-1	U		0.15		U	GAM
Europium 152	14683-23-9	U		0.082	0.10	U	GAM
Europium 154	15585-10-1	U		0.10	0.10	U	GAM
Europium 155	14391-16-3	U		0.059	0.10	U	GAM
Thorium 228	14274-82-9	U		0.044		U	GAM
Thorium 232	TH-232	U		0.15		U	GAM
Uranium 235	15117-96-1	U		0.10		U	GAM
Uranium 238	U-238	U		4.1		U	GAM
Americium 241	14596-10-2	U		0.066		U	GAM

Confirmation Sampling - Soil

QC-BLANK 45748

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/16/03</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H2354

R309132-09

Method Blank

METHOD BLANK

SDG <u>7599</u>	Client/Case no <u>Hanford</u>	SDG <u>H2354</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309132-09</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7599-009</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B03-015</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Total Strontium	SR-RAD	-0.070	0.10	0.24	1.0	U	SR

Confirmation Sampling - Soil

QC-BLANK 45803

000027

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>10/16/03</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2354

R309132-04

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7599</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> <u>SDG H2354</u> Contract No. <u>630</u>
Lab sample id <u>R309132-04</u> Dept sample id <u>7599-004</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>B03-015</u>

ANALYTE	RESULT	2σ ERR	MDA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST	pCi/g	pCi/g	%	(TOTAL)	LIMITS
Gross Alpha	245	16	2.3	10	93A	214	8.6	114	63-137	70-130
Gross Beta	241	11	7.1	15	93B	229	9.2	105	75-125	70-130
Tritium	12.7	0.38	0.24	400	H	13.6	0.54	93	84-116	80-120
Carbon 14	1600	32	8.7	50	C	1800	72	89	85-115	80-120
Cobalt 60	4.25	0.23	<u>0.087</u>	0.050	GAM	4.57	0.18	93	77-123	80-120
Cesium 137	4.79	0.20	<u>0.11</u>	0.10	GAM	4.61	0.18	104	75-125	80-120

Confirmation Sampling - Soil

QC-LCS 45747

Lab id <u>EBERLINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>10/16/03</u>

000028

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2354

R309132-08

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7599</u>	Client/Case no <u>Hanford</u>	SDG <u>H2354</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R309132-08</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7599-008</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B03-015</u>	

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
Total Strontium	11.8	0.62	0.23	1.0	SR	11.5	0.46	103	82-118	80-120

Confirmation Sampling - Soil

QC-LCS 45802

LAB CONTROL SAMPLES

Page 2

SUMMARY DATA SECTION

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000029

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>10/16/03</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2354

R309132-06

J00Y83

DUPLICATE

SDG <u>7599</u>	Client/Case no <u>Hanford</u>	SDG <u>H2354</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R309132-06</u>	Lab sample id <u>R309132-01</u>	Client sample id <u>J00Y83</u>
Dept sample id <u>7599-006</u>	Dept sample id <u>7599-001</u>	Location/Matrix <u>115-B Gas Recirc. Bldg. SOLID</u>
	Received <u>09/25/03</u>	Collected/Weight <u>09/18/03 08:33 1388 g</u>
% solids <u>98.6</u>	% solids <u>98.6</u>	Custody/SAF No <u>B03-015-136 B03-015</u>

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	5.40	3.2	4.0	10		93A	6.47	3.1	2.4		18	120	
Gross Beta	15.9	4.6	6.3	15		93B	16.5	4.3	5.7		4	66	
Tritium	0.045	0.14	0.24	400	U	H	0.147	0.15	0.24	U	-		
Carbon 14	-0.174	1.4	2.4	50	U	C	-1.02	1.7	2.8	U	-		
Potassium 40	10.7	1.7	0.80			GAM	10.7	1.1	0.51		0	43	
Cobalt 60	U		0.11	0.050	U	GAM	U		0.057	U	-		
Cesium 137	0.188	0.094	0.10	0.10		GAM	0.150	0.063	0.058		22	105	
Radium 226	0.346	0.15	0.15			GAM	0.402	0.10	0.10		15	79	
Radium 228	0.873	0.40	0.37			GAM	0.377	0.25	0.27		79	118	
Europium 152	U		0.22	0.10	U	GAM	U		0.13	U	-		
Europium 154	U		0.32	0.10	U	GAM	U		0.15	U	-		
Europium 155	U		0.21	0.10	U	GAM	U		0.13	U	-		
Thorium 228	0.556	0.093	0.090			GAM	0.473	0.061	0.059		16	46	
Thorium 232	0.873	0.40	0.37			GAM	0.377	0.25	0.27		79	118	
Uranium 235	U		0.37		U	GAM	U		0.17	U	-		
Uranium 238	U		12		U	GAM	U		6.6	U	-		
Americium 241	U		0.23		U	GAM	U		0.12	U	-		

Confirmation Sampling - Soil

QC-DUP#1 45749

DUPLICATES

Page 1

SUMMARY DATA SECTION

Page 12

000030

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>10/16/03</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2354

R309132-10

J00Y84

DUPLICATE

SDG <u>7599</u>	Client/Case no <u>Hanford</u>	SDG <u>H2354</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R309132-10</u>	Lab sample id <u>R309132-02</u>	Client sample id <u>J00Y84</u>
Dept sample id <u>7599-010</u>	Dept sample id <u>7599-002</u>	Location/Matrix <u>115-B Gas Recirc. Bldg. SOLID</u>
	Received <u>09/25/03</u>	Collected/Weight <u>09/18/03 09:06 1461 g</u>
% solids <u>96.9</u>	% solids <u>96.9</u>	Custody/SAF No <u>B03-015-137 B03-015</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- FIERS	RPD %	3σ TOT	PROT LIMIT
Total Strontium	2.37	0.51	0.60	1.0		SR	2.47	0.28	0.22		4	42	

Confirmation Sampling - Soil

QC-DUP#2 45804

DUPLICATES

Page 2

SUMMARY DATA SECTION

Page 13

000031

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>10/16/03</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2354

R309132-07

J00Y83

MATRIX SPIKE

SDG <u>7599</u>	Client/Case no <u>Hanford</u>	SDG <u>H2354</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
MATRIX SPIKE	ORIGINAL	
Lab sample id <u>R309132-07</u>	Lab sample id <u>R309132-01</u>	Client sample id <u>J00Y83</u>
Dept sample id <u>7599-007</u>	Dept sample id <u>7599-001</u>	Location/Matrix <u>115-B Gas Recirc. Bldg. SOLID</u>
	Received <u>09/25/03</u>	Collected/Weight <u>09/18/03 08:33 1388 g</u>
% solids <u>98.6</u>	% solids <u>98.6</u>	Custody/SAF No <u>B03-015-136 B03-015</u>

ANALYTE	SPIKE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	ORIGINAL pCi/g	2σ ERR (COUNT)	REC 3σ % (TOTAL)	LMTS LIMITS	PROTOCOL
Tritium	51.0	0.71	0.23	400	X	H	55.7	2.2	0.147	0.15	91	85-115	60-140

Confirmation Sampling - Soil

QC-MS#1 45750

MATRIX SPIKES

Page 1

SUMMARY DATA SECTION

Page 14

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-MS</u>
Version <u>3.06</u>
Report date <u>10/16/03</u>

000032

Date: 27 November 2003
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: Remaining Sites Confirmation Sampling - Soil - Waste Site Evaluation for 100-B-14:2 Sanitary Sewer (100-B-14 Process and Sanitary Sewer Underground Pipelines).
Subject: Inorganics - Data Package No. H2354-LLI (SDG No. H2354)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H2354-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	Media	Validation	Waste Site	Analysis
J00Y83	9/18/03	Soil	C	100-B-14	See note 1
J00Y84	9/18/03	Soil	C	100-B-14	See note 1
J00Y85	9/18/03	Soil	C	100-B-14	See note 1

1 - ICP metals; mercury by 7471A.

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and 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 28 days for mercury and 6 months for ICP metals.

000001

All holding times were acceptable.

- **Preparation (Method) Blanks**

Preparation Blanks

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

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

All preparation blank results were acceptable.

Field (Equipment) Blank

No equipment blanks were submitted for analysis.

- **Accuracy**

Matrix Spike and Laboratory Control Sample

Matrix spike (MS) and laboratory control sample (LCS) analyses are used to assess the analytical accuracy of the reported data. The matrix spike is used to assess the effect of the matrix on the ability to accurately quantify sample concentrations. Recoveries must fall within the range of 75% to 125%. Samples with a recovery of less than 25% and a sample result below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

000002

Due to a matrix spike recovery outside QC limits (155%), all calcium results were qualified as estimates and flagged "J".

Due to a matrix spike recovery outside QC limits (62%), all antimony results were qualified as estimates and flagged "J".

All other accuracy 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 duplicates (J00Y84/J00Y85) were submitted for analysis. Field duplicates 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 remaining waste sites RDLs to ensure that laboratory detection levels meet the required criteria. All reported results met the analyte specific RDL.

- **Completeness**

Data package No. H2354-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%.

000003

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to a matrix spike recovery outside QC limits (155%), all calcium results were qualified as estimates and flagged "J". Due to a matrix spike recovery outside QC limits (62%), all antimony results were qualified as estimates and flagged "J". Data flagged "J" indicates that the associated concentration is an estimate, but under the BHI-statement of work, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

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

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

Appendix 1

Glossary of Data Reporting Qualifiers

000005

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).

000006

Appendix 2
Summary of Data Qualification

000007

INORGANIC DATA QUALIFICATION SUMMARY

SDG: H2354	REVIEWER: TLI	DATE: 11/27/03	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony Calcium	J	All	MS recovery

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: BECHTEL-HANFORD																
Laboratory: LLJ																
Case: SDG: H2354																
Sample Number	J00Y83				J00Y84				J00Y85							
Remarks																
Sample Date	9/18/03				9/18/03				Duplicate				9/18/03			
Inorganics	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Silver	0.2	0.08	U	0.08	U	0.08	U									
Aluminum		8250		5980		6050										
Arsenic		4.1		3.2		2.9										
Boron		2.9		1.5		1.7										
Barium	20	92.6		60.3		64.9										
Beryllium		0.64		0.59		0.61										
Calcium		8470	J	5840	J	6280	J									
Cadmium	0.2	0.10		0.05		0.04										
Cobalt		9.9		8.5		7.9										
Chromium	1	12.0		15.8		14.0										
Copper		20.0		18.7		18.1										
Iron		24300		24500		22700										
Mercury	0.2	0.02		0.10		0.13										
Potassium		2000		970		1010										
Magnesium		5280		4310		4200										
Manganese		412		330		324										
Molybdenum		0.19	U	0.42		0.25										
Sodium		466		275		281										
Nickel		13.8		10.8		10.3										
Lead	5	7.1		5.0		4.5										
Antimony		0.28	UJ	0.28	UJ	0.29	UJ									
Selenium	1	0.28	U	0.28	U	0.29	U									
Silicon		336		313		331										
Vanadium		58.0		51.0		55.5										
Zinc		51.2		50.0		47.5										

000010

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

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/01/03

CLIENT: TNU-HANFORD B03-015
 WORK ORDER: 11343-606-001-9999-00

H2354

LVL LOT #: 0309L565

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J00Y83	Silver, Total	0.08	u	MG/KG 0.08	1.0
		Aluminum, Total	8250		MG/KG 4.6	1.0
		Arsenic, Total	4.1		MG/KG 0.41	1.0
		Boron, Total	2.9		MG/KG 0.22	1.0
		Barium, Total	92.6		MG/KG 0.02	1.0
		Beryllium, Total	0.64		MG/KG 0.04	1.0
		Calcium, Total	8470		MG/KG 3.0	1.0
		Cadmium, Total	0.10		MG/KG 0.04	1.0
		Cobalt, Total	9.9		MG/KG 0.12	1.0
		Chromium, Total	12.0		MG/KG 0.1	1.0
		Copper, Total	20.0		MG/KG 0.12	1.0
		Iron, Total	24300		MG/KG 1.9	1.0
		Mercury, Total	0.02		MG/KG 0.02	1.0
		Potassium, Total	2000		MG/KG 2.3	1.0
		Magnesium, Total	5280		MG/KG 0.68	1.0
		Manganese, Total	412		MG/KG 0.03	1.0
		Molybdenum, Total	0.19	u	MG/KG 0.19	1.0
		Sodium, Total	466		MG/KG 0.69	1.0
		Nickel, Total	13.8		MG/KG 0.20	1.0
		Lead, Total	7.1		MG/KG 0.19	1.0
		Antimony, Total	0.28	u	MG/KG 0.28	1.0
		Selenium, Total	0.28	u	MG/KG 0.28	1.0
		Silicon, Total	336		MG/KG 0.53	1.0
		Vanadium, Total	58.0		MG/KG 0.09	1.0
		Zinc, Total	51.2		MG/KG 0.25	1.0

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 11/22/07

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/01/03

CLIENT: TNU-HANFORD B03-015
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0309L565

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	J00Y84	Silver, Total	0.08	u MG/KG	0.08	1.0
		Aluminum, Total	5980	MG/KG	4.6	1.0
		Arsenic, Total	3.2	MG/KG	0.41	1.0
		Boron, Total	1.5	MG/KG	0.21	1.0
		Barium, Total	60.3	MG/KG	0.02	1.0
		Beryllium, Total	0.59	MG/KG	0.04	1.0
		Calcium, Total	5840	J MG/KG	3.0	1.0
		Cadmium, Total	0.05	MG/KG	0.04	1.0
		Cobalt, Total	8.5	MG/KG	0.12	1.0
		Chromium, Total	15.8	MG/KG	0.1	1.0
		Copper, Total	18.7	MG/KG	0.12	1.0
		Iron, Total	24500	MG/KG	1.9	1.0
		Mercury, Total	0.10	MG/KG	0.02	1.0
		Potassium, Total	970	MG/KG	2.3	1.0
		Magnesium, Total	4310	MG/KG	0.68	1.0
		Manganese, Total	330	MG/KG	0.03	1.0
		Molybdenum, Total	0.42	MG/KG	0.19	1.0
		Sodium, Total	275	MG/KG	0.69	1.0
		Nickel, Total	10.8	MG/KG	0.20	1.0
		Lead, Total	5.0	MG/KG	0.19	1.0
		Antimony, Total	0.28	u J MG/KG	0.28	1.0
		Selenium, Total	0.28	u MG/KG	0.28	1.0
		Silicon, Total	313	MG/KG	0.53	1.0
		Vanadium, Total	51.0	MG/KG	0.09	1.0
		Zinc, Total	50.0	MG/KG	0.25	1.0

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 11/22/03

000012

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 10/01/03

CLIENT: TNU-HANFORD B03-015
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0309L565

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-003	J00Y85	Silver, Total	0.08	u MG/KG	0.08	1.0
		Aluminum, Total	6050	MG/KG	4.7	1.0
		Arsenic, Total	2.9	MG/KG	0.42	1.0
		Boron, Total	1.7	MG/KG	0.22	1.0
		Barium, Total	64.9	MG/KG	0.02	1.0
		Beryllium, Total	0.61	MG/KG	0.04	1.0
		Calcium, Total	6280	J MG/KG	3.1	1.0
		Cadmium, Total	0.04	MG/KG	0.04	1.0
		Cobalt, Total	7.9	MG/KG	0.12	1.0
		Chromium, Total	14.0	MG/KG	0.10	1.0
		Copper, Total	18.1	MG/KG	0.12	1.0
		Iron, Total	22700	MG/KG	2.0	1.0
		Mercury, Total	0.13	MG/KG	0.02	1.0
		Potassium, Total	1010	MG/KG	2.4	1.0
		Magnesium, Total	4200	MG/KG	0.70	1.0
		Manganese, Total	324	MG/KG	0.03	1.0
		Molybdenum, Total	0.25	MG/KG	0.19	1.0
		Sodium, Total	281	MG/KG	0.71	1.0
		Nickel, Total	10.3	MG/KG	0.20	1.0
		Lead, Total	4.5	MG/KG	0.19	1.0
		Antimony, Total	0.29	u J MG/KG	0.29	1.0
		Selenium, Total	0.29	u MG/KG	0.29	1.0
		Silicon, Total	331	MG/KG	0.54	1.0
		Vanadium, Total	55.5	MG/KG	0.09	1.0
		Zinc, Total	47.5	MG/KG	0.26	1.0

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000013

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000014



Analytical Report

Client: TNU-HANFORD B03-015
LVL#: 0309L565
SDG/SAF#: H2354/B03-015

W.O.#: 11343-606-001-9999-00
Date Received: 09-25-03

METALS CASE NARRATIVE

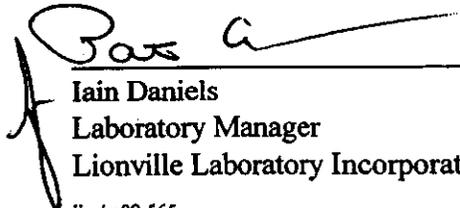
1. This narrative covers the analyses of 3 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LvLI's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits (80-120% for Mercury).
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The matrix spike (MS) recoveries for 5 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. The PDS and serial dilution were performed on sample J00Y83 instead of sample J00Y84, which had the matrix QC done on. A PDS was prepared at meaningful concentration level for the following analytes:

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 22 pages.

000015

<u>Sample ID</u>	<u>Element</u>	<u>PDS Concentration (ppb)</u>	<u>PDS % Recovery</u>
J00Y83	Aluminum	20,000	100.0
	Calcium	20,000	107.9
	Iron	20,000	102.3
	Manganese	2000	100.1
	Antimony	100	108.1

12. The duplicate analyses for 5 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. 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.
14. 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
 jjw/m09-565

10-02-03
 Date



000016

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			
for Eliason/D. Bowers		Company Contact Ella Feist		Telephone No. 372-9140	Project Coordinator KESSNER, JH
t Designation Training Sites Confirmation Sampling-Soil		Sampling Location 115-B Gas Recirc. Bldg. Pipelines - A14 (100-B-14)		SAF No. B03-015	Price Code 8L Air Quality <input type="checkbox"/>
test No. ERC-96009		Field Logbook No. EL-1578-1	COA C17HXB671C	Method of Shipment Federal Express	
ed To RECRA ERLINE SERVICES (Formerly TMA) <i>07/9403</i>		Offsite Property No. A030375		Bill of Lading/Air Bill No. SEE OSPC	

SPECIAL HANDLING AND/OR STORAGE 000017	Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C			
	Type of Container	#G	#G	#G	#G	#G	#G			
	No. of Container(s)	1	1	1	1	1	1			
	Volume	1000mL	60mL	250mL	120mL	250mL	120mL			

SAMPLE ANALYSIS		See item (1) in Special Instructions.	Carboe-14; Tritium - H2	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081; @Nitro-Herbicides - 8083-8085 RW 9/18/03	Semi-VOA - 8270A (TCL)			
-----------------	--	---------------------------------------	-------------------------	---------------------------------------	---------------------	--	------------------------	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time							
1783	SOIL	9/18/03	0833		X	X	X	X		

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
<i>my Bowers</i>	9/18/03	<i>Joan Kessner</i>	9-18-03/1410
<i>REF 3C 3728</i>	92403 1300	<i>SIGALAN</i>	92403 1300
<i>JGALK</i>	92403 1300	<i>FED EX</i>	
<i>Joe En</i>	9.25.03/0925	<i>Joan Kessner</i>	9.25.03/0925

SPECIAL INSTRUCTIONS
If gross alpha is detected above background, then contact Joan Kessner to determine if further alpha specific analyses is needed. If gross beta is detected above background, then strontium analyses will be performed.

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; 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); **RW 9-18-03**

(2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Personnel not available to Relinquish samples from 3728
Ref # **309 9124103**

Matrix *

- S=Soil
- SS=Solids
- SL=Solid
- SL=Sludge
- W=Water
- D=Oil
- A=Air
- DS=Drum Solids
- DL=Drum Liquids
- T=Times
- W=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			B03-015-137	Page 1 of 1
Collector R. Nielson/D. Bowers	Company Contact Ella Feist	Telephone No. 372-9140	Project Coordinator KESSNER, JH		Price Code 8L	Data Turnaround
Project Designation Remaining Sites Confirmation Sampling-Soil	Sampling Location 115-B Gas Recirc. Bldg. Pipelines - A16 (100-B-14)		SAF No. B03-015		Air Quality <input type="checkbox"/>	-21 Days 7/10/03
Field Chest No. ERC 02 107	Field Logbook No. EL-1578-1	COA C17HXB671C	Method of Shipment Federal Express			
Shipped To RECRA BERKLINE SERVICES (Formerly TMA) 9/19/03	Offsite Property No. A030375		Bill of Lading/Air Bill No. SEE OSPC			

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	Cool 4C	Cool 4C	Cool 4C					
	Type of Container	aG	aG	aG	aG	aG	aG					
	No. of Container(s)	1	1	1	1	1	1					
	Volume	1000mL	60mL	250mL	120mL	250mL	120mL					

Special Handling and/or Storage	See item (1) in Special Instructions.	Carbon-14; Tritium - F3	See item (2) in Special Instructions.	Chromium Hex - 7196	PCBs - 8082; Pesticides - 8081; Herbicides - EPA 816-1-2/1/03	Semi-VOA - 8270A (TCL)						
	SAMPLE ANALYSIS											

Sample No.	Matrix *	Sample Date	Sample Time									
100Y84	SOIL	9-18-03	0906			X	X	X	X			
100Y85	SOIL	9-18-03	0906			X	X	X	X			

Personnel not available to Relinquish samples from 3728 Ref # 3C on 9/24/03

CHAIN OF POSSESSION		Sign/Print Names	
Relinquished By/Removed From D. Bowers 9/18/03 1300	Date/Time 9/18/03 1300	Received By/Stored In R. Feist 9/18/03 1300	Date/Time 9/18/03 1300
Relinquished By/Removed From S. Gale 9/24/03 1300	Date/Time 9/24/03 1300	Received By/Stored In FED EX	Date/Time
Relinquished By/Removed From Fed Ex 9/25/03/0925	Date/Time 9/25/03/0925	Received By/Stored In J. Smith 9/25/03/0925	Date/Time 9/25/03/0925
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
If gross alpha is detected above background, then contact Joan Kessner to determine if further alpha specific analyses is needed. If gross beta is detected above background, then strontium analyses will be performed.

(1) Gamma Spectroscopy (TCL List) (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241); Americium-241; Gross Alpha & Gross Beta; Nickel-63; Isotopic Plutonium (Plutonium-238, Plutonium-239/240); Strontium-90/90 - Total Sr; Technetium-99; Isotopic Uranium (Uranium-233/234, Uranium-235, Uranium-238) 9/19/03
(2) ICP Metals - 6010TR (SW846) (Aluminum, Antimony, Arsenic, Barium, Beryllium, Boron, Cadmium, Calcium, Chromium, Cobalt, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Nickel, Potassium, Selenium, Silicon, Silver, Sodium, Vanadium, Zinc); Mercury - 7471 - (CV)

Calc. No. 0100B-CA-VD180

Matrix *

- S=Soil
- SE=Soilment
- 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

Appendix 5

Data Validation Supporting Documentation

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-B-14		DATA PACKAGE: H2354		
VALIDATOR:	TLI	LAB: TLI		DATE: 11/18/03	
CASE:			SDG: H2354		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J00Y83		J00Y8Y		J00Y8S	
Soil					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

Comments: _____

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

Initial calibrations performed on all instruments? Yes No **N/A**
 Initial calibrations acceptable? Yes No **N/A**
 ICP interference checks acceptable? Yes No **N/A**
 ICV and CCV checks performed on all instruments? Yes No **N/A**
 ICV and CCV checks acceptable? Yes No **N/A**
 Standards traceable? Yes No **N/A**
 Standards expired? Yes No **N/A**
 Calculation check acceptable? Yes No **N/A**

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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: Calcium MS - 15500 - J all
Antimony MS - 62.270 J all
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?	<input checked="" type="radio"/> Yes	No	N/A
Sample holding times acceptable?	<input checked="" type="radio"/> 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*
Results 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)*
Transcriptions/calculation errors? (Levels D, E) Yes No *(N/A)*

Comments:

Appendix 6

Additional Documentation Requested by Client

000025

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 10/01/03

CLIENT: TNU-HANFORD B03-015
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0309L565

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	03L0560-MB1	Silver, Total	0.08 u	MG/KG	0.08	1.0
		Aluminum, Total	4.7 u	MG/KG	4.7	1.0
		Arsenic, Total	0.42 u	MG/KG	0.42	1.0
		Boron, Total	0.22 u	MG/KG	0.22	1.0
		Barium, Total	0.02	MG/KG	0.02	1.0
		Beryllium, Total	0.04 u	MG/KG	0.04	1.0
		Calcium, Total	3.1 u	MG/KG	3.1	1.0
		Cadmium, Total	0.04 u	MG/KG	0.04	1.0
		Cobalt, Total	0.12 u	MG/KG	0.12	1.0
		Chromium, Total	0.12	MG/KG	0.10	1.0
		Copper, Total	0.12 u	MG/KG	0.12	1.0
		Iron, Total	2.0 u	MG/KG	2.0	1.0
		Potassium, Total	2.4 u	MG/KG	2.4	1.0
		Magnesium, Total	1.2	MG/KG	0.70	1.0
		Manganese, Total	0.03 u	MG/KG	0.03	1.0
		Molybdenum, Total	0.19 u	MG/KG	0.19	1.0
		Sodium, Total	1.2	MG/KG	0.71	1.0
		Nickel, Total	0.20 u	MG/KG	0.20	1.0
		Lead, Total	0.19 u	MG/KG	0.19	1.0
		Antimony, Total	0.29 u	MG/KG	0.29	1.0
		Selenium, Total	0.29 u	MG/KG	0.29	1.0
		Silicon, Total	0.54 u	MG/KG	0.54	1.0
		Vanadium, Total	0.09 u	MG/KG	0.09	1.0
		Zinc, Total	0.26 u	MG/KG	0.26	1.0
BLANK1	03C0250-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

000026

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/01/03

CLIENT: TNU-HANFORD B03-015
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0309L565

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J00Y83	Mercury, Total	0.18	0.02	0.15	112.8	1.0

000027

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 10/01/03

CLIENT: TNU-HANFORD 803-015
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0309L565

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-002	J00Y84	Silver, Total	4.3	0.08u	4.6	93.5	1.0
		Aluminum, Total	6620	5980	183	348.5*	1.0
		Arsenic, Total	178	3.2	183	95.6	1.0
		Boron, Total	88.7	1.5	91.6	95.2	1.0
		Barium, Total	241	60.3	183	98.8	1.0
		Beryllium, Total	5.0	0.59	4.6	95.9	1.0
		Calcium, Total	9410	5840	2290	155.9	1.0
		Cadmium, Total	4.5	0.05	4.6	96.7	1.0
		Cobalt, Total	51.4	8.5	45.8	93.7	1.0
		Chromium, Total	30.9	15.8	18.3	82.5	1.0
		Copper, Total	39.5	18.7	22.9	90.8	1.0
		Iron, Total	25500	24500	91.6	1145 *	1.0
		Potassium, Total	3300	970	2290	101.7	1.0
		Magnesium, Total	6650	4310	2290	102.1	1.0
		Manganese, Total	388	330	45.8	127.1*	1.0
		Molybdenum, Total	88.3	0.42	91.6	95.9	1.0
		Sodium, Total	2620	275	2290	102.5	1.0
		Nickel, Total	54.9	10.8	45.8	96.3	1.0
		Lead, Total	48.7	5.0	45.8	95.4	1.0
		Antimony, Total	28.5	0.28u	45.8	62.2	1.0
		Selenium, Total	167	0.28u	183	91.3	1.0
		Silicon, Total	395	313	91.6	89.6	1.0
		Vanadium, Total	96.3	51.0	45.8	98.9	1.0
		Zinc, Total	92.1	50.0	45.8	91.9	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/01/03

CLIENT: TNU-HANFORD B03-015
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0309L565

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	J00Y83	Mercury, Total	0.02	0.02	43.9	1.0

000029

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 10/01/03

CLIENT: TNU-HANFORD B03-015
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0309L565

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-002REP	J00Y84	Silver, Total	0.08u	0.08u	NC	1.0
		Aluminum, Total	5980	6020	0.60	1.0
		Arsenic, Total	3.2	2.5	24.6	1.0
		Boron, Total	1.5	1.4	6.9	1.0
		Barium, Total	60.3	64.6	6.9	1.0
		Beryllium, Total	0.59	0.62	5.0	1.0
		Calcium, Total	5840	5410	7.5	1.0
		Cadmium, Total	0.05	0.06	18.8	1.0
		Cobalt, Total	8.5	7.9	7.3	1.0
		Chromium, Total	15.8	19.8	22.5	1.0
		Copper, Total	18.7	16.6	11.9	1.0
		Iron, Total	24500	22000	10.8	1.0
		Potassium, Total	970	992	2.3	1.0
		Magnesium, Total	4310	4150	3.9	1.0
		Manganese, Total	330	315	4.8	1.0
		Molybdenum, Total	0.42	0.26	45.9	1.0
		Sodium, Total	275	272	1.2	1.0
		Nickel, Total	10.8	10.5	2.8	1.0
		Lead, Total	5.0	4.5	10.5	1.0
		Antimony, Total	0.28u	0.28u	NC	1.0
		Selenium, Total	0.28u	0.28u	NC	1.0
		Silicon, Total	313	247	23.5	1.0
		Vanadium, Total	51.0	54.4	6.5	1.0
		Zinc, Total	50.0	53.2	6.2	1.0

000030

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 10/01/03

CLIENT: TNU-HANFORD B03-015
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0309L565

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	03L0560-LC1	Silver, LCS	49.1	50.0	MG/KG	98.2
		Aluminum, LCS	495	500	MG/KG	99.1
		Arsenic, LCS	962	1000	MG/KG	96.2
		Boron, LCS	480	500	MG/KG	96.0
		Barium, LCS	499	500	MG/KG	99.8
		Beryllium, LCS	24.6	25.0	MG/KG	98.4
		Calcium, LCS	2490	2500	MG/KG	99.8
		Cadmium, LCS	24.9	25.0	MG/KG	99.6
		Cobalt, LCS	251	250	MG/KG	100.3
		Chromium, LCS	50.3	50.0	MG/KG	100.6
		Copper, LCS	126	125	MG/KG	100.9
		Iron, LCS	498	500	MG/KG	99.5
		Potassium, LCS	2430	2500	MG/KG	97.3
		Magnesium, LCS	2440	2500	MG/KG	97.4
		Manganese, LCS	75.6	75.0	MG/KG	100.8
		Molybdenum, LCS	506	500	MG/KG	101.2
		Sodium, LCS	2450	2500	MG/KG	98.2
		Nickel, LCS	200	200	MG/KG	100
		Lead, LCS	247	250	MG/KG	98.9
		Antimony, LCS	290	300	MG/KG	96.8
		Selenium, LCS	921	1000	MG/KG	92.1
		Silicon, LCS	480	500	MG/KG	95.9
		Vanadium, LCS	245	250	MG/KG	98.0
		Zinc, LCS	98.4	100	MG/KG	98.4
LCS1	03C0250-LC1	Mercury, LCS	6.5	6.2	MG/KG	104.8

000031

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