

Date: 7 April 2002
 To: Bechtel Hanford Inc. (technical representative)
 From: TechLaw, Inc.
 Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
 Subject: Gasoline & Diesel Range Organics - Data Package No. H1571-LLI (SDG No. H1571)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1571-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 Level	Analysis
B13CK9	10/31/01	Soil	C	See note 1

1-Diesel range organics, motor oil, n-propyl alcohol and ethanol by 8015B.

Data validation was conducted in accordance with the BHI validation statement of work and the *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211*, BHI-01562, Rev. 0, October 2001. 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 time is assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements is 14 days to extraction and 40 days for analysis.

All holding times were acceptable.

- **Blanks**

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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 project quantitation limit (PQL) 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 PQL level and qualified as undetected "U".

All blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 70% to 130%. Samples with a spike recovery of less than 25% and a sample result below the instrument detection limit (IDL) are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to the lack of a matrix spike analysis, the motor oil result was qualified as estimate and flagged "J".

All matrix spike recovery 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 surrogate recoveries are out of control limits (50-100%) or outside laboratory control limits, all associated sample results greater than the target required quantitation limit (PQL) are qualified as estimates and flagged "J". Sample results less than the PQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the PQL 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".

Due to the surrogate being diluted out, the motor oil and diesel range organics results were qualified as estimates and flagged "J".

All other surrogate recovery 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

- No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211* PQLs to ensure that laboratory detection levels meet the required criteria. All undetected results exceeded the PQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H1571-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 reported.

MINOR DEFICIENCIES

Due to the lack of a matrix spike analysis, the motor oil result was qualified as estimate and flagged "J". Due to the surrogate being diluted out, the motor oil and diesel range organics results were qualified as estimates and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All undetected results exceeded the PQL. 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-01562, Rev. 0, *Sampling and Analysis Instruction for the 216-A-29 Ditch for Project W-211*, October 2001.

Appendix 1
Glossary of Data Reporting Qualifiers

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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

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DATA QUALIFICATION SUMMARY

SDG: H1571	REVIEWER: TLI	DATE: 4/7/02	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Diesel range organics Motor oil	J	All	Surrogate diluted out
Motor oil	J	All	No matrix spike analysis

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Sample Information	RFW#:	Matrix:	D.F.:	Units:	Cust ID:	B13C81	B13C81	B13C81	B13C81	B13CK9	BLK	BLK B8
	001	SOIL	1.00	mg/kg	B13C81	001 MS	001 MSD	002	01LE1331-MB1	01LE1331-MB1	BLK	BLK B8
						SOIL	SOIL	SOIL				SOIL
						1.00	1.00	4.00	1.00	1.00		1.00
						mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		mg/kg
p-Terphenyl	62	†	76	†	97	†	D	†	38	†	52	†
Diesel Range Organics	14.6	U	76	†	94	†	73.6	U	12.0	U	63	†
Motor Oil	14.6	U	NS		760		12.0	U	12.0	U	NS	

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 3/30/02
 11-11-01

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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

000013



Analytical Report

Client: THU HANFORD
LVL#: 0111L256

W.O.#: 11343-606-001-9999-00
Date Received: 11-02-01

GC SCAN

The set of samples consisted of two (2) soil samples collected on 10-30-01.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on Method 8015B for Gasoline Range Organic (GRO) target compounds Ethanol and n-Propyl Alcohol on 11-05-01.

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

1. The samples were packaged and stored as specified in the method protocol.
2. Surrogates are not currently employed in the methodology.
3. All initial calibrations were within acceptance criteria.
4. All continuing calibrations run prior to analysis were within acceptance criteria.
5. All blank spike recoveries were within acceptance criteria.
6. All matrix spike recoveries were within acceptance criteria.


Jean Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11/13/01
Date

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The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 9 pages.

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Lionville Laboratory, Inc.
GCSC ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008 H1508/H157

DATE RECEIVED: 11/02/01

LVL LOT # :0111L256

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13C81	001	S	01LJMB05	10/30/01	11/05/01	11/05/01
B13C81	001 MS	S	01LJMB05	10/30/01	11/05/01	11/05/01
B13C81	001 MSD	S	01LJMB05	10/30/01	11/05/01	11/05/01
B13CK9	002	S	01LJMB05	10/31/01	11/05/01	11/05/01

LAB QC:

BLK	MB1	S	01LJMB05	N/A	11/05/01	11/05/01
BLK	MB1 BS	S	01LJMB05	N/A	11/05/01	11/05/01
BLK	MB1 BSD	S	01LJMB05	N/A	11/05/01	11/05/01

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Analytical Report

Client: TNU-HANFORD B02-008
LVL#: 0111L256
SDG/SAF#: H1568/H1571/B02-008

W.O.#: 11343-606-001-9999-00
Date Received: 11-02-01

DIESEL RANGE ORGANICS

The set of samples consisted of two (2) soil samples collected on 10-30-01.

The samples and their associated QC samples were prepared on 11-05-01 and analyzed according to Lionville Laboratory OPs based on EPA Method 8015B for Diesel Range Petroleum Hydrocarbons on 11-07-01. The analysis met the intent of method WTPH-D.

1. All cooler temperatures have been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis were met.
3. All initial calibrations associated with this data set were within acceptance criteria.
4. All diesel continuing calibration standards analyzed prior to the sample extracts were within acceptance criteria.
5. All obtainable surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All matrix spike recoveries were within acceptance criteria.
8. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the laboratory Manager or a designee, as verified by the following signature.


Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated

11/13/01
Date

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The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 8 pages. 000026



Appendix 5

Data Validation Supporting Documentation

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GENERAL ORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200 ASC 200-cs-1		DATA PACKAGE: H1571		
VALIDATOR:	TLI	LAB: LLI	DATE: 30 Mar 02		
CASE:			SDG: H1571		
ANALYSES PERFORMED					
8015B	8021	8141	8151	8315	
		WTPH-HCID	WTPH-G	WTPH-D	
SAMPLES/MATRIX: Soil					
B13c1e9					

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)

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: _____

GENERAL ORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: _____

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

- Surrogates/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 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: used BSS for surr (per guidance) eth + n-propyl
Motor oil + DR - Surr dil out - J all

GENERAL ORGANIC 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. HOLDING TIMES (all levels)

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

Comments: _____

GENERAL ORGANIC ANALYSIS DATA VALIDATION CHECKLIST

8. COMPOUND IDENTIFICATION, 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: _____

9. SAMPLE CLEANUP (Levels D and E)

Fluoridil ® (or other aborbant) cleanup performed? Yes No N/A
Lot check performed? Yes No N/A
Check recoveries acceptable? Yes No N/A
Check materials traceable? Yes No N/A
Check materials Expired? Yes No N/A
Analytical batch QC given similar cleanup? Yes No N/A
Transcription/Calculation Errors? Yes No N/A

Comments: _____

000022

Date: 7 April 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: Wet Chemistry - Data Package No. H1571-LLI (SDG No. H1571)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1571-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
B13CK9	10/31/01	Soil	C	See note 1 & 2

1-IC Anions - 300.0 (chloride, fluoride, nitrate, nitrite, phosphate, sulfate); cyanide by 9010B; chromium VI by 7196A; ammonia - 350.3; hydrazine USAFSAM-Report TR-82-29; nitrate/nitrite 353.2; sulphide 9030B.

2-Nitrate not validated per BHI instructions (SAF B02-008).

Data validation was conducted in accordance with the BHI validation statement of work and the **200-CS-1 Work Plan (DOE/RL-99-44, Rev 0)**. Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

• Holding Times

Analytical holding times are assessed to ascertain whether the holding time requirements have been met by the laboratory. The holding time requirements are as follows: 30 days for chromium VI; 28 days for ammonia, hydrazine, nitrate/nitrite and IC anions (chloride, sulphate, fluoride); 14 days for cyanide; 7 days for sulphide; 2 days for IC anions (nitrate, nitrite, phosphate); and immediate for pH.

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".

Due to the holding time being exceeded by greater than twice the limit, all nitrate and pH results were qualified as estimates and flagged "J".

Due to the holding time being exceeded by greater than twice the limit, all nitrite and phosphate results were qualified as rejected and flagged "UR".

Holding times were met for all other parameters and samples.

- **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 project quantitation limit (PQL) to be acceptable.

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike

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

All matrix spike recovery results were acceptable.

- **Precision**

- Laboratory Duplicate Samples

- Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within relative percent difference (RPD) limits of plus or minus 30%. If RPD values are out of specification and the sample concentration is greater than five times the PQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are within plus or minus two times the PQL and the sample concentration is less than five times the PQL, the results are acceptable. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

- Due to an RPD outside QC limits (34.5%), the ammonia result was qualified as an estimate and flagged "J".

- All other laboratory duplicate results were within the required control limits.

- Field Duplicate Samples

- No field duplicate results were submitted for analysis.

- **Analytical Detection Levels**

- Reported analytical detection levels are compared against Sampling and Analysis Instruction for the **200-CS-1 Work Plan** target required quantitation limits (PQL) to ensure that laboratory detection levels meet the required criteria. Nitrite, fluoride, cyanide, phosphate and sulphide results were reported above the PQL. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific PQL.

- **Completeness**

- Data package No. H1571-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 85%.

MAJOR DEFICIENCIES

Due to the holding time being exceeded by greater than twice the limit, all nitrate and phosphate results were qualified as rejected and flagged "UR". Rejected data is not valid and should not be reported.

MINOR DEFICIENCIES

Due to the holding time being exceeded by greater than twice the limit, all nitrite and pH results were qualified as estimates and flagged "J". Due to an RPD outside QC limits (34.5%), the ammonia result was qualified as an estimate 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.

Nitrite, fluoride, cyanide, phosphate and sulphide results were reported above the PQL.

REFERENCES

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

200-CS-1 Work Plan (DOE/RL-99-44, Rev 0).

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WHC procedures 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 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. 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 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 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

000006

DATA QUALIFICATION SUMMARY

SDG: H1571	REVIEWER: TLI	DATE: 4/7/02	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nitrate pH	J	All	Holding time
Nitrite Phosphate	UR	All	Holding time
Ammonia	J	All	RPD

000007

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000008

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/16/01

CLIENT: TNU-HANFORD B02-008 H1568/H1571
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: Q111L256

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B13C81	% Solids	82.3	%	0.01	1.0
		Chloride by IC	6.6	MG/KG	1.5	1.0
		Fluoride by IC	3.0	u MG/KG	3.0	1.0
		Nitrite by IC	1.52	u MG/KG	1.52	1.0
		Nitrate by IC	300	MG/KG	15.2	10.0
		Cyanide, Total	0.53	u MG/KG	0.53	1.0
		Phosphate by IC	1.5	u MG/KG	1.5	1.0
		Chromium VI	0.49	u MG/KG	0.49	1.0
		Sulfate by IC	61.7	MG/KG	1.5	1.0
		Hydrazine	1.2	u MG/KG	1.2	1.0
		Nitrate Nitrite	69.6	MG/KG	2.4	10.0
		Ammonia, as N	11.6	MG/KG	3.7	1.0
		pH	8.3	SOIL PH	0.01	1.0
		Sulfide	46.4	u MG/KG	46.4	1.0
-002	B13CK9	% Solids	65.0	%	0.01	1.0
		Chloride by IC	226	MG/KG	9.6	5.0
		Fluoride by IC	19.2	u MG/KG	19.2	5.0
		Nitrite by IC	9.62	uR MG/KG	9.62	5.0
		Nitrate by IC	927	J MG/KG	38.5	20.0
		Cyanide, Total	0.72	u MG/KG	0.72	1.0
		Phosphate by IC	9.6	uR MG/KG	9.6	5.0
		Chromium VI	3.0	MG/KG	0.62	1.0
		Sulfate by IC	2970	MG/KG	192	100
		Hydrazine	1.5	u MG/KG	1.5	1.0
		Nitrate Nitrite	210	MG/KG	6.3	20.0
		Ammonia, as N	34.3	MG/KG	3.8	1.0
		pH	6.5	J SOIL PH	0.01	1.0
		Sulfide	61.2	u MG/KG	61.2	1.0

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000011



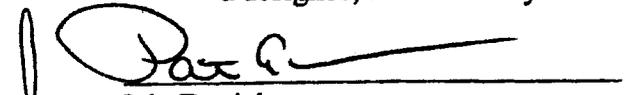
Analytical Report

Client: TNU-HANFORD B02-008 H1568/H1571
LVL#: 0111L256

W.O.#: 11343-606-001-9999-00
Date Received: 11-02-01

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 soil samples.
2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The cooler temperatures were recorded on the chain of custody.
5. The method blanks were within the method criteria.
6. The Laboratory Control Samples (LCS) were within the laboratory control limits. The duplicate LCS were within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recoveries were within the 75-125% control limits with the exception of Sulfide that was below the control limits that may be attributed to sample inhomogeneity.
8. The replicate analyses were within the 20% RPD control limit with the exception of Chloride, Ammonia and Sulfide that may be attributed to sample inhomogeneity.
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
 Deputy Laboratory Manager
 Lionville Laboratory Incorporated

11-19-01
 Date

njp11-256

The results presented in this report relate to the analytical testing and conditions of the samples upon receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 16 pages.

000012

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B02-008 H1568/H1571

DATE RECEIVED: 11/02/01

LVL LOT # :0111L256

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13CK9						
% SOLIDS	002	S	01L*S152	10/31/01	11/05/01	11/06/01
CHLORIDE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
FLUORIDE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
NITRITE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
NITRATE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
TOTAL CYANIDE	002	S	01LCA98	10/31/01	11/09/01	11/09/01
TOTAL CYANIDE	002 REP	S	01LCA98	10/31/01	11/09/01	11/09/01
TOTAL CYANIDE	002 MS	S	01LCA98	10/31/01	11/09/01	11/09/01
PHOSPHATE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
CHROMIUM VI	002	S	01LVI086	10/31/01	11/07/01	11/07/01
SULFATE BY IC	002	S	01LXC074	10/31/01	11/08/01	11/08/01
HYDRAZINE	002	S	01LHZ004	10/31/01	11/06/01	11/06/01
NITRATE NITRITE	002	S	01LN3061	10/31/01	11/15/01	11/15/01
AMMONIA	002	S	01LAM050	10/31/01	11/08/01	11/08/01
AMMONIA	002 REP	S	01LAM050	10/31/01	11/08/01	11/08/01
AMMONIA	002 MS	S	01LAM050	10/31/01	11/08/01	11/08/01
PH	002	S	01LPH075	10/31/01	11/05/01	11/05/01
SULFIDE	002	S	01LSDA60	10/31/01	11/05/01	11/05/01
SULFIDE	002 REP	S	01LSDA60	10/31/01	11/05/01	11/05/01
SULFIDE	002 MS	S	01LSDA60	10/31/01	11/05/01	11/05/01

LAB QC:

CHLORIDE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01
CHLORIDE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
FLUORIDE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01
FLUORIDE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
NITRITE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01
NITRITE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
NITRATE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01
NITRATE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
TOTAL CYANIDE	LCS L	S	01LCA98	N/A	11/09/01	11/09/01
TOTAL CYANIDE	LCS L	S	01LCA98	N/A	11/09/01	11/09/01
TOTAL CYANIDE	MB1	S	01LCA98	N/A	11/09/01	11/09/01
PHOSPHATE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B02-008 H1568/H1571

DATE RECEIVED: 11/02/01

LVL LOT # :0111L256

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
PHOSPHATE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
CHROMIUM VI	MB1	S	01LVI086	N/A	11/07/01	11/07/01
CHROMIUM VI	MB1 BS	S	01LVI086	N/A	11/07/01	11/07/01
CHROMIUM VI	MB1 BS	S	01LVI086	N/A	11/07/01	11/07/01
SULFATE BY IC	MB1	S	01LXC074	N/A	11/08/01	11/08/01
SULFATE BY IC	MB1 BS	S	01LXC074	N/A	11/08/01	11/08/01
HYDRAZINE	MB1	S	01LHZ004	N/A	11/06/01	11/06/01
HYDRAZINE	MB1 BS	S	01LHZ004	N/A	11/06/01	11/06/01
HYDRAZINE	MB1 BSD	S	01LHZ004	N/A	11/06/01	11/06/01
NITRATE NITRITE	MB1	S	01LN3061	N/A	11/15/01	11/15/01
NITRATE NITRITE	MB1 BS	S	01LN3061	N/A	11/15/01	11/15/01
AMMONIA	MB1	S	01LAM050	N/A	11/08/01	11/08/01
AMMONIA	MB1 BS	S	01LAM050	N/A	11/08/01	11/08/01
AMMONIA	MB1 BSD	S	01LAM050	N/A	11/08/01	11/08/01
SULFIDE	MB1	S	01LSDA60	N/A	11/05/01	11/05/01
SULFIDE	MB1 BS	S	01LSDA60	N/A	11/05/01	11/05/01

000021A

Company Contact Clearlock, CS Telephone No. 372-9638
 Sampling Location 200 East & West
 Field Logbook No. E2-1551 COA XL2002CHGR
 Method of Shipment Fed Ex
 Bill of Lading/Air-Bill No. A/A 19301

Offsite Property No. A/A 19301
 Mapped To TMS/RECA
 POSSIBLE SAMPLE HAZARDS/REMARKS
 TIE TO B13084
 Samples stored in Ref. # 1A at the 3728 Shipping Facility on 10/30/01. Collector not available to relinquish samples on 11/10/01 for shipment.

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	See item (2) in Special Instructions.	See item (3) in Special Instructions.	Cool 4C Cool 4C	None	Cool 4C Cool 4C	None	Cool 4C Cool 4C	None	Cool 4C Cool 4C	None
113C81	SOIL	10/30/01	0830	See item (1) in Special Instructions. 10/30/01	See item (2) in Special Instructions.	See item (3) in Special Instructions.	1000mL	500mL	1000mL	1000mL	1000mL	1000mL	120mL	120mL

SPECIAL INSTRUCTIONS

** The laboratory is to report Dioxins as a TIC if present in detectable quantities.
 ** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

(1) Gross Alpha-Gross Beta, Gamma Spectroscopy (Canister-137, Cobalt-60, Radium-226, Uranium-238, Uranium-235, Thorium-232, Polonium-210, Polonium-214, Radium-226, Radium-228, Sodium-22, Tin-123), Strontium-90, Total GY-Carbonate, Total Uranium, Isotopic Phenomena, Isotopic Thorium, (Thorium-232), Americium-241, Neptunium-237, Isotopic Uranium - 10/30/01

(2) ICP Metals - 6010A (Supertoxes) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertoxes Add-On) (Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196

(3) NO2/NO3 - 353.2; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfide - 9030; Ammonia - 350.3; Total Cyanide - 9010

(4) Semi-VOA - \$270A (Add-On) (Triethyl phosphate); TPH-Diesel Range - WTPH-D

Received By/Removed From	Date/Time	Received By/Stored In	Date/Time
DSWATSON/ELMER	10/30/01 1215	REF-1A	3/28/08 10:30:01
SWANSON/ELMER	10/30/01 0900	SWANSON/ELMER	11-1-01 0900
SWANSON/ELMER	11-1-01 0900	SWANSON/ELMER	11-1-01 0900
SWANSON/ELMER	11-1-01 0900	SWANSON/ELMER	11-1-01 0900
SWANSON/ELMER	11/2/01 0935	SWANSON/ELMER	12/01 0935

Bechtel Hanford Inc. **CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** **B02-008-02** Page 1 of 1

Collector: **Bowers DL/Watson DJ** Telephone No. **372-9638** Project Coordinator: **TRENT, SJ** Price Code **8N** Data Turnaround: **45 Days**

Project Designation: **200 Area Source Characterization 200-CS-1 OU - Waste Mana** Sampling Location: **200 East & West** Air Quality

Ice Chest No. **SEE OSRC** Field Logbook No. **EL 111** COA: **B20CS1673C** Method of Shipment: **Fed Ex**

Shipped To: **TMA/ECRA** Bill of Lading/Air Bill No. **SEE OSRC**

OFFSITE PROPERTY No. **A020018**

POSSIBLE SAMPLE HAZARDS/REMARKS

Tieto BIRCL4

Samples stored in Ref. # **B** at the 3728 Shipping Facility on **11/11/01**.
Collector not available to relinquish samples on **11/11/01** for shipment.

RT 11-1-01

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	None	500mL	1000mL	1000mL	60mL	None	Cool AC	None	Cool AC	None
B13CK9	SOIL	10-31-01	0750		X	X	X	X	X	X	X	X	X	X

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
<i>[Signature]</i>	10-31-01 11:00	<i>[Signature]</i>	10-31-01 11:10
<i>[Signature]</i>	11-1-01 09:00	<i>[Signature]</i>	11-1-01 09:35
<i>[Signature]</i>	11-1-01 09:35	<i>[Signature]</i>	11-1-01 09:35

SPECIAL INSTRUCTIONS

** The laboratory is to report Decane as a TIC if present in detectable quantities.

** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

(1) - Gross Alpha, Gross Beta, Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Tritium);
 (2) - ICP Metals - 6010A (Supertones) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver);
 ICP Metals - 6010A (Supertones Add-On) (Aluminum, Beryllium, Boron, Calcium, Copper, Iron, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc); Mercury - 7471 - (CV); Chromium Hex - 7196
 (3) NO2/NO3 - 333.2; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate);
 Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010
 (4) Semi-VOA - 6770A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D

LABORATORY SECTION Received By: _____ Date/Time: _____

FINAL SAMPLE DISPOSITION Disposal Method: _____ Date/Time: _____

BHI-EE-011 (10/99)

Appendix 5
Data Validation Supporting Documentation

000015

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	200ASC 200-CS-1		DATA PACKAGE: H1571		
VALIDATOR:	TL	LAB: LLD	DATE: 30 Mar 02		
CASE:			SDG: H1571		
ANALYSES PERFORMED					
Anions/IC	TOC	TOX	TPH-418.1	Oil and Grease	Alkalinity
Ammonia	BOD/COD	Chloride	Chromium-VI	pH	NO₃/NO₂
Sulfate	TDS	TKN	Phosphate	sulphide	hydrogen
X Cyanide					
SAMPLES/MATRIX	B13CK9		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: _____

Handwritten signature

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

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

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

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

Laboratory blanks analyzed? Yes No N/A

Laboratory blank results acceptable? Yes No N/A

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

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

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

Comments: _____

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

Spike samples analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

Sike standards NIST traceable? (Levels D, E) Yes No N/A

Spike standards expired? (Levels D, E) Yes No N/A

LCS/BSS samples analyzed? Yes No N/A

LCS/BSS results acceptable? Yes No N/A

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

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

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

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

Performance audit sample results acceptable? Yes No N/A

Comments: _____

GENERAL CHEMISTRY DATA VALIDATION CHECKLISTS

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

Duplicate RPD values acceptable? Yes No N/A
 Duplicate results acceptable? Yes No N/A
 MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
 MS/MSD standards expired? (Levels D, E) Yes No N/A
 Field duplicate RPD values acceptable? Yes No N/A
 Field split RPD values acceptable? Yes No N/A
 Transcription/calculation errors? (Levels D, E) Yes No N/A
 Comments: ammonia 34.5 cl -ok

6. HOLDING TIMES (all levels)

Samples properly preserved? Yes No N/A
 Sample holding times acceptable? Yes No N/A
 Comments: nitrate - 8 days J/UR UR
nitrite " " J
phosphate " " J/UR
pH 5 days J

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: Fluoride, nitrite, cyanide, phosphate, sulphid over

Appendix 6

Additional Documentation Requested by Client

000020

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/16/01

CLIENT: TNU-HANFORD B02-008 H1568/H1571
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0111L256

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	01LXC074-MB1	Chloride by IC	1.2	u MG/KG	1.2	1.0
		Fluoride by IC	2.5	u MG/KG	2.5	1.0
		Nitrite by IC	1.25	u MG/KG	1.25	1.0
		Nitrate by IC	1.25	u MG/KG	1.25	1.0
		Phosphate by IC	1.2	u MG/KG	1.2	1.0
		Sulfate by IC	1.2	u MG/KG	1.2	1.0
BLANK1	01LCA98-MB1	Cyanide, Total	0.50	u MG/KG	0.50	1.0
BLANK10	01LVI086-MB1	Chromium VI	0.40	u MG/KG	0.40	1.0
BLANK10	01LH2004-MB1	Hydrazine	1.0	u MG/KG	1.0	1.0
BLANK10	01LN3061-MB1	Nitrate Nitrite	0.20	u MG/KG	0.20	1.0
BLANK10	01LAM050-MB1	Ammonia, as N	2.5	u MG/KG	2.5	1.0
BLANK10	01LSDA60-MB1	Sulfide	40.0	u MG/KG	40.0	1.0

000021

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/16/01

CLIENT: TNU-HANFORD B02-008 H1568/H1571
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0111L256

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B13C81	Chloride by IC	37.1	6.6	30.0	101.6	1.0
		Fluoride by IC	65.1	0.74	61.0	105.5	1.0
		Nitrite by IC	30.2	1.52u	30.0	100.8	1.0
		Nitrate by IC	902	300	608	99.0	20.0
		Phosphate by IC	30.3	1.5 u	30.0	101.0	1.0
		Soluble Chromium VI	4.6	0.49u	4.9	90.2	1.0
		Insoluble Chromium VI	1330	0.49u	1160	115.1	100
		Sulfate by IC	203	61.7	152	92.8	5.0
		Hydrazine	6.3	1.2 u	6.1	103.6	1.0
		Nitrate Nitrite	124	69.6	56.8	95.1	10.0
-002	B13CK9	Cyanide, Total	4.38	0.72u	4.74	92.4	1.0
		Ammonia, as N	196	34.3	184	87.7	1.0
		Sulfide	387	42.9	473	72.7	1.0
BLANK10	01LXC074-MB1	Chloride by IC	23.8	1.2 u	25.0	95.3	1.0
		Fluoride by IC	51.9	2.5 u	50.0	103.9	1.0
		Nitrite by IC	24.2	1.25u	25.0	96.6	1.0
		Nitrate by IC	24.9	1.25u	25.0	99.6	1.0
		Phosphate by IC	26.1	1.2 u	25.0	104.4	1.0
		Sulfate by IC	24.1	1.2 u	25.0	96.3	1.0
BLANK10	01LVI086-MB1	Soluble Chromium VI	4.0	0.40u	4.0	100.9	1.0
		Insoluble Chromium VI	1060	0.40u	1090	96.4	100
BLANK10	01LHZ004-MB1	Hydrazine	5.2	1.0 u	5.0	103.1	1.0
		Hydrazine MSD	5.2	1.0 u	5.0	103.6	1.0
BLANK10	01LN3061-MB1	Nitrate Nitrite	5.2	0.20u	5.0	103.0	1.0
BLANK10	01LAN050-MB1	Ammonia, as N	103	2.5 u	100	102.8	1.0
		Ammonia, as N MSD	103	2.5 u	100	103.2	1.0
BLANK10	01LSDA60-MB1	Sulfide	293	40.0 u	309	94.8	1.0

000022

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Lionville Laboratory, Inc.

INORGANICS DUPLICATE SPIKE REPORT 11/16/01

CLIENT: TNU-HANFORD B02-008 H1568/H1571
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0111L256

SAMPLE	SITE ID	ANALYTE	SPIKE#1		SPIKE#2	
			%RECOV	%RECOV	%RECOV	%DIFF
BLANK10	01LH2004-MB1	Hydrazine	103.1	103.6	0.46	
BLANK10	01LAM050-MB1	Ammonia, as N	102.8	103.2	0.49	

000023

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/16/01

CLIENT: TNU-HANFORD B02-008 H1568/H1571
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0111L256

SAMPLE	SITE ID	ANALYTE	INITIAL	REPLICATE RPD		DILUTION
			RESULT			FACTOR (REP)
-001REP	B13C81	% Solids	82.3	82.6	0.30	1.0
		Chloride by IC	6.6	4.8	32.3	1.0
		Fluoride by IC	3.0 u	3.0 u	NC	1.0
		Nitrite by IC	1.52u	1.52u	NC	1.0
		Nitrate by IC	300	301	0.48	10.0
		Phosphate by IC	1.5 u	1.5 u	NC	1.0
		Chromium VI	0.49u	0.49u	NC	1.0
		Sulfate by IC	61.7	60.5	2.0	1.0
		Hydrazine	1.2 u	1.2 u	NC	1.0
		Nitrate Nitrite	69.6	67.2	3.4	10.0
		pH	8.3	8.4	0.6	1.0
-002REP	B13CK9	Cyanide, Total	0.72u	0.64u	NC	1.0
		Ammonia, as N	34.3	48.6	34.5	1.0
		Sulfide	61.2 u	60.1	NC 33.3 11-1-01	1.0

000024

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Date: 7 April 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: Volatile - Data Package No. H1571-LLI (SDG No. H1571)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1571-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
B13CK9	10/31/02	Soil	C	Volatiles by 8260A
B13CK9(reprep)	10/31/01	Soil	C	Volatiles by 8260A

Data validation was conducted in accordance with the BHI validation statement of work and the **200-CS-1 Work Plan (DOE/RL-99-44, Rev 0)**. Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

• Holding Times

Analytical holding times are assessed to ascertain whether the holding time requirements were met by the laboratory. Samples must be analyzed within 14 days of the date of sample collection for VOAs. If holding times are exceeded, but not by greater than twice 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 twice 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 met.

- **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 of a given matrix. 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 project quantitation limit (PQL) and is less than five times (or less than ten times for laboratory contaminants) the highest associated blank result, the sample result value is raised to the PQL, qualified as undetected and flagged "U".

Due to method blank contamination, the methylene chloride result was in sample B13CK9 was qualified as undetected and flagged "U".

All other method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike/matrix spike duplicate analyses are performed in duplicate using the target compounds for which percent recoveries must be within established laboratory quality 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 matrix spike/matrix spike duplicate recovery results were acceptable.

Surrogate Recovery

The analysis of surrogate compounds provides a measure of system performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Samples with surrogate recoveries less than ten percent are qualified as estimates and flagged "J" for detects, and rejected and flagged "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification. Surrogates are not required for formaldehyde analysis.

All surrogate recovery 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 by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of +/-35% for solid samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

- All precision results were acceptable.

- Field Duplicate Samples

- No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

- Reported analytical detection levels are compared against the **200-CS-1 Work Plan** PQLs to ensure that laboratory detection levels meet the required criteria. Forty-two undetected analytes had reported analytical detection levels above the analyte specific PQL. Under the BHI statement of work, no qualification is required. Under the BHI

validation SOW, no qualification is required.

- **Completeness**

Data package No. H1571-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 method blank contamination, the methylene chloride result was in sample B13CK9 was qualified as undetected and flagged "U".

Forty-two undetected analytes had reported analytical detection levels above the analyte specific PQL.

REFERENCES

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

200-CS-1 Work Plan (DOE/RL-99-44, Rev 0).

Appendix 1
Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validator 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 sample quantitation limit corrected for dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- J - Indicates the compound or analyte was analyzed for and detected. Due to a minor QC deficiency identified during the data validation, the associated quantitation limit is an estimate.
- R - Indicates the compound or analyte was analyzed for, detected, and due to an identified major QC deficiency, the data are unusable.
- UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified major QC deficiency.
- NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).
- N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

000007

DATA QUALIFICATION SUMMARY

SDG: H1571	REVIEWER: TLI	DATE: 4/7/02	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	J	B12CK9	Blank contamination

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

RFW Batch Number: 0111L256 Cust ID: VBLKYQ BS VBLKZG VBLKZG BS

Sample Information RFW#: 01LVH475-MB1 01LVH478-MB1 01LVH478-MB1
 Matrix: SOIL SOIL SOIL
 D.F.: 1.00 1.00 1.00
 Units: ug/Kg ug/Kg ug/Kg

Surrogate	109 %	101 %	103 %
Toluene-d8	10 U	10 U	10 U
Bromofluorobenzene	92 %	87 %	91 %
Recovery 1,2-Dichloroethane-d4	104 %	100 %	99 %
Chloromethane	10 U	10 U	10 U
Bromomethane	10 U	10 U	10 U
Vinyl Chloride	10 U	10 U	10 U
Chloroethane	9 B	4 J	4 JB
Methylene Chloride	10 U	10 U	10 U
Acetone	5 U	5 U	5 U
Carbon Disulfide	87 %	5 U	86 %
1,1-Dichloroethene	5 U	5 U	5 U
1,1-Dichloroethane	5 U	5 U	5 U
1,2-Dichloroethene (total)	5 U	5 U	5 U
Chloroform	5 U	5 U	5 U
1,2-Dichloroethane	10 U	10 U	10 U
2-Butanone	5 U	5 U	5 U
1,1,1-Trichloroethane	5 U	5 U	5 U
Carbon Tetrachloride	5 U	5 U	5 U
Bromodichloromethane	5 U	5 U	5 U
1,2-Dichloropropane	5 U	5 U	5 U
cis-1,3-Dichloropropene	5 U	5 U	5 U
Trichloroethene	107 %	5 U	104 %
Dibromochloromethane	5 U	5 U	5 U
1,1,2-Trichloroethane	5 U	5 U	5 U
Benzene	108 %	5 U	107 %
Trans-1,3-Dichloropropene	5 U	5 U	5 U
Bromoform	5 U	5 U	5 U
4-Methyl-2-pentanone	10 U	10 U	10 U
2-Hexanone	10 U	10 U	10 U
Tetrachloroethene	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5 U	5 U	5 U
Toluene	112 %	5 U	112 %

Handwritten: ✓
3/30/02

000013

*= Outside of EPA CLP QC limits.

RFW Batch Number: 01111256 Client: TNU-HANFORD B02-008 Work Order: 11343606001 Page: 2b
Cust ID: VBLKYQ BS VBLKZG VBLKZG BS

RFW#: 01LVH475-MB1 01LVH478-MB1 01LVH478-MB1

Chlorobenzene	105	‡	5	U	105	‡
Ethylbenzene	5	U	5	U	5	U
Styrene	5	U	5	U	5	U
Xylene (total)	5	U	5	U	5	U

*= Outside of EPA CLP QC limits.

K
3/30/02

000014

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000015



Client: TNU-HANFORD B02-008
LVL #: 0111L256
SDG/SAF #: H1568, H1571/B02-008

W.O. #: 11343-606-001-9999-00
Date Received: 11-02-2001

GC/MS VOLATILE

Two (2) water samples were collected on 10-30,31-2001.

The samples and their associated QC samples were analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8260A for TCL Volatile target compounds on 11-10,12-2001.

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

1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.
2. Samples were analyzed within required holding time.
3. Non-target compounds were not detected in the samples.
4. Two (2) of twenty-seven (27) surrogate recoveries were outside EPA QC limits. The out of criteria sample B13CK9 was reanalyzed on 11-12-2001 and reported.
5. All matrix spike recoveries were within EPA QC limits.
6. All blank spike recoveries were within EPA QC limits.
7. The method blanks contained the common laboratory contaminant Methylene Chloride at levels less than 2x the CRQL.
8. Internal standard area criteria were not met for sample B13CK9. The out of criteria sample B13CK9 was reanalyzed on 11-12-2001 and reported.
9. A spectral search was performed for Decane; however, it was not detected in the samples.
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

11/21/01
Date

Lionville Laboratory Incorporated

son\group\data\voe\tnu-hanford\0111-256.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.

000026

02



Lionville Laboratory, Inc.
VOA ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008

DATE RECEIVED: 11/02/01

LVL LOT # :0111L256

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13C81	001	S	01LVH475	10/30/01	N/A	11/10/01
B13C81	001 MS	S	01LVH475	10/30/01	N/A	11/10/01
B13C81	001 MSD	S	01LVH475	10/30/01	N/A	11/10/01
B13CK9	002	S	01LVH475	10/31/01	N/A	11/10/01
B13CK9	002 R1	S	01LVH478	10/31/01	N/A	11/12/01

LAB QC:

VBL

VBLKYQ	MB1	S	01LVH475	N/A	N/A	11/10/01
VBLKYQ	MB1 BS	S	01LVH475	N/A	N/A	11/10/01
VBLKZG	MB1	S	01LVH478	N/A	N/A	11/12/01
VBLKZG	MB1 BS	S	01LVH478	N/A	N/A	11/12/01

000027A

Bechtel Hanford Inc.
 Collector
 Thomas, G/Watson, D
 Telephone No.
 372-9638

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
 Project Coordinator
 TRENT, SJ

Company Contact
 Cesarlock, CS
 Sampling Location
 200 East & West
 Field Logbook No.
 EL-1551

Project Designation
 200 Area Source Characterization 200-CS-1 OU - Waste Mans
 Project No.
 B02-008-01
 Price Code
 8K
 Air Quality
 45 Days
 15 Days

Ice Chest No.
 SEE ESR
 Method of Shipment
 Fed Ex
 Method of Shipment
 Fed Ex

Shipped To
 TMS/RECA
 POSSIBLE SAMPLE HAZARDS/REMARKS
 TIE TO B13084
 Samples stored in Ref. # 1A at the 3728 Shipping Facility on 10/30/01. Collector not available to relinquish samples on 11/10/01 for shipment.

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Preservation	None	Cool 4C Cool 4C	Cool 4C Cool 4C	None	Cool 4C Cool 4C	None	Cool 4C Cool 4C	None
B13C81	SOIL	10/30/01	0830	None	None	None	None	None	None	None	None	None

CHAIN OF POSSESSION

Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
DSWATSON/RECA	10/30/01 12:05	REF-1A	3/28/06 8:30 AM
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
REF-1A	11-1-01 0900	THORNTON	11-1-01 0900
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
REF-1A	11-1-01 0900	THORNTON	11-1-01 0900
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
REF-1A	11-1-01 0900	THORNTON	11-1-01 0900
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
REF-1A	11/26/01 0935	V. Hernandez	12/01/01 0935
Relinquished By/Removed From	Date/Time	Received By/Stored In	Date/Time
REF-1A	11/26/01 0935	V. Hernandez	12/01/01 0935

SPECIAL INSTRUCTIONS
 ** The laboratory is to report Benzene as a TIC if present in detectable quantities.
 ** The laboratory is to report both diesel and kerosene range compounds from WTPH-D analysis

(1) Chromatograph-Gas-Boat, Chromatography (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-157, Gamma-232, Add-on, Americium-241, Antimony-125, Barium-133, Cesium-134, Curium-242, Radium-226, Radium-228, Sodium-22, Th-232); Strontium-89, 90 - Total Strontium; Total Uranium; Isotopic Uranium-Isotopic Thorium / Thorium-232); Americium-241-Nephtalium-237; Isotopic Lithium - 10.30.01

(2) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver); ICP Metals - 6010A (Supertrace Add-On) (Aluminum, Beryllium, Bismuth, Boron, Calcium, Copper, Iron, Manganese, Molybdenum, Nickel, Potassium, Sodium, Thallium, Vanadium, Zinc); Mercury - 7471. (CV); Chromium Hex - 7196

(3) NO2/NO3 - 333.2; IC Anions - 300.0 (Chloride, Fluoride, Nitrate, Nitrite, Phosphate, Sulfate); Sulfides - 9030; Ammonia - 350.3; Total Cyanide - 9010

(4) Semi-YOA - 870A (Add-On) (Tributyl phosphate); TPH-Diesel Range - WTPH-D

Matrix *
 Soil
 Sediment
 Sludge
 W - Water
 Oil
 Air
 De-Drum Solids
 De-Drum Liquids
 T-Trace
 W-Wipe
 L-Liquid
 V-Vapor
 X-Other

LABORATORY SECTION
 Received By
 Title

FINAL SAMPLE DISPOSITION
 Disposed By
 Date/Time

BHI-EE-011 (10/99)

Appendix 5

Data Validation Supporting Documentation

000018

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	200 Asc 200-05-1		DATA PACKAGE: H1571		
VALIDATOR:	TLI	LAB: LLI	DATE: 30M602		
CASE:			SDG: H1571		
ANALYSES PERFORMED					
<u>SW-846 8260</u>		SW-846 8260 (TCLP)	SW-846 8270		SW-846 8270 (TCLP)
SAMPLES/MATRIX Soil					
B13CK9 B13CK9 reanalysis					

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: methylene chloride in blank U * ckg only

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: toluene over both samples - Fall detected
OK MC 12 dichloroethane
tetrachloroethane
No toluene associated

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: 42 compounds 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: 7 April 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: Semivolatile - Data Package No. H1571-LLI (SDG No. H1571)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1571-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
B13CK9	10/31/01	Soil	C	Semivolatiles by 8270C

Data validation was conducted in accordance with the BHI validation statement of work and the **200-CS-1 Work Plan (DOE/RL-99-44, Rev 0)**. Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

All holding times were met.

- **Method Blanks**

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate Recoveries

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

All MS/MSD 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 PQL are qualified as estimates and flagged "J". Sample results less than the PQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the PQL 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 recoveries 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 +/-35%. 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 precision results were acceptable.

- Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the **200-CS-1 Work Plan** PQLs to ensure that laboratory detection levels meet the required criteria. All undetected analytes exceeded the PQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H1571-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 PQL. 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.

200-CS-1 Work Plan (DOE/RL-99-44, Rev 0).

Appendix 1

Glossary of Data Reporting Qualifiers

000005

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

000007

DATA QUALIFICATION SUMMARY

SDG: H1571	REVIEWER: TLI	DATE: 4/7/02	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned.			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: BECHTEL-HANFORD		Case: B13CK9		SDG: H1571	
Laboratory: LLI		Sample Number		Remarks	
Sample Date		10/31/01		Remarks	
Extraction Date		11/5/01		Remarks	
Analysis Date		11/16/01		Remarks	
Semivolatile (8270C)	CRQL	Result	Q	Result	Q
Phenol	330	2600	U		
bis(2-Chloroethyl)ether	330	2600	U		
2-Chlorophenol	330	2600	U		
1,3-Dichlorobenzene	330	2600	U		
1,4-Dichlorobenzene	330	2600	U		
1,2-Dichlorobenzene	330	2600	U		
2-Methylphenol	330	2600	U		
2,2-Oxybis(1-chloropropane)	330	2600	U		
4-Methylphenol	330	2600	U		
N-Nitroso-di-n-propylamine	330	2600	U		
Hexachloroethane	330	2600	U		
Nitrobenzene	330	2600	U		
Isophorone	330	2600	U		
2-Nitrophenol	660	2600	U		
2,4-Dimethylphenol	330	2600	U		
bis(2-Chloroethoxy)methane	330	2600	U		
2,4-Dichlorophenol	330	2600	U		
1,2,4-Trichlorobenzene	330	2600	U		
Naphthalene	330	2600	U		
4-Chloroaniline	330	2600	U		
Hexachlorobutadiene	330	2600	U		
4-Chloro-3-methylphenol	330	2600	U		
2-Methylnaphthalene	330	2600	U		
Hexachlorocyclopentadiene	330	2600	U		
2,4,6-Trichlorophenol	330	2600	U		
2,4,5-Trichlorophenol	330	6400	U		
2-Chloronaphthalene	330	2600	U		
2-Nitroaniline	330	6400	U		
Dimethylphthalate	330	2600	U		
Acenaphthylene	330	2600	U		
2,6-Dinitrotoluene	330	2600	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.

Project: BECHTEL-HANFORD		SDG: H1571	
Laboratory: Lionville Laboratory Inc.			
Sample Number	B13CK9		
Remarks			
Sample Date	10/31/01		
Extraction Date	11/5/01		
Analysis Date	11/16/01		
Semivolatiles (8270C)	CRQL	Result	Q
3-Nitroaniline	330	6400	U
Acenaphthene	330	2600	U
2,4-Dinitrophenol	825	6400	U
4-Nitrophenol	660	6400	U
Dibenzofuran	330	2600	U
2,4-Dinitrotoluene	330	2600	U
Diethylphthalate	330	2600	U
4-Chlorophenyl-phenyl ether	330	2600	U
Fluorene	330	2600	U
4-Nitroaniline	330	6400	U
4,6-Dinitro-2-methylphenol	330	2600	U
N-Nitrosodiphenylamine	330	2600	U
4-Bromophenyl-phenyl ether	330	2600	U
Hexachlorobenzene	330	2600	U
Pentachlorophenol	330	6400	U
Phenanthrene	330	370	
Anthracene	330	2600	U
Carbazole	330	2600	U
Di-n-butylphthalate	330	2700	
Fluoranthene	330	370	
Pyrene + A21	330	350	
Butylbenzylphthalate	330	290	
3,3'-Dichlorobenzidine	330	2600	U
Benzo(a)anthracene	330	180	
Chrysene	330	210	
bis(2-Ethylhexyl)phthalate	330	6200	
Di-n-octylphthalate	330	2600	U
Benzo(b)fluoranthene	330	240	
Benzo(k)fluoranthene	330	2600	U
Benzo(a)pyrene	330	160	
Indeno(1,2,3-cd)pyrene	330	2600	U
Dibenz(a,h)anthracene	330	2600	U
Benzo(g,h,i)perylene	330	2600	U
Tributylphosphate	3300	310	

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.

000011

Handwritten initials at the top left of the page.

Chemical Name	001	002	002 MS	002 MSD	01LE1329-MB1	01LE1329-MB1
2-Chloronaphthalene	400 U	2600 U	2600 U	2600 U	330 U	330 U
2-Nitroaniline	1000 U	6400 U	6400 U	6400 U	830 U	830 U
Dimethylphthalate	400 U	2600 U	2600 U	2600 U	330 U	330 U
Acenaphthylene	400 U	2600 U	2600 U	2600 U	330 U	330 U
2,6-Dinitrotoluene	400 U	2600 U	2600 U	2600 U	330 U	330 U
3-Nitroaniline	1000 U	6400 U	6400 U	6400 U	830 U	830 U
Acenaphthene	400 U	2600 U	98	100	330 U	94
2,4-Dinitrophenol	1000 U	6400 U	6400 U	6400 U	830 U	830 U
4-Nitrophenol	1000 U	6400 U	92	85	830 U	105
Dibenzofuran	400 U	2600 U	2600 U	2600 U	330 U	330 U
2,4-Dinitrotoluene	400 U	2600 U	83	89	330 U	105 *
Diethylphthalate	400 U	2600 U	2600 U	2600 U	330 U	330 U
4-Chlorophenyl-phenylether	400 U	2600 U	2600 U	2600 U	330 U	330 U
Fluorene	400 U	2600 U	2600 U	2600 U	330 U	330 U
4-Nitroaniline	1000 U	6400 U	6400 U	6400 U	830 U	830 U
4,6-Dinitro-2-methylphenol	1000 U	6400 U	6400 U	6400 U	830 U	830 U
N-Nitrosodiphenylamine (1)	400 U	2600 U	2600 U	2600 U	330 U	330 U
4-Bromophenyl-phenylether	400 U	2600 U	2600 U	2600 U	330 U	330 U
Hexachlorobenzene	400 U	2600 U	2600 U	2600 U	330 U	330 U
Pentachlorophenol	1000 U	6400 U	41	45	830 U	101
Phenanthrene	150 J	370 J	250 J	290 J	330 U	330 U
Anthracene	400 U	2600 U	2600 U	2600 U	330 U	330 U
Carbazole	400 U	2600 U	2600 U	2600 U	330 U	330 U
Di-n-Butylphthalate	220 J	2700 J	2600 U	4800	330 U	20 J
Fluoranthene	120 J	370 J	290 J	380 J	330 U	330 U
Pyrene	99 J	350 J	92	105	330 U	114
Butylbenzylphthalate	400 U	290 J	830 J	420 J	330 U	330 U
3,3'-Dichlorobenzidine	400 U	2600 U	2600 U	2600 U	330 U	330 U
Benzo(a)anthracene	34 J	180 J	240 J	330 J	330 U	330 U
Chrysene	40 J	210 J	280 J	330 J	330 U	330 U
bis(2-Ethylhexyl)phthalate	400 U	6200 U	4800	8100	330 U	20 J
Di-n-Octyl phthalate	400 U	2600 U	2600 U	2600 U	330 U	330 U
Benzo(b)fluoranthene	37 J	240 J	310 J	350 J	330 U	330 U
Benzo(k)fluoranthene	400 U	2600 U	2600 U	2600 U	330 U	330 U
Benzo(a)pyrene	22 J	160 J	230 J	300 J	330 U	330 U
Indeno(1,2,3-cd)pyrene	400 U	2600 U	2600 U	2600 U	330 U	330 U
Dibenzo(a,h)anthracene	400 U	2600 U	2600 U	2600 U	330 U	330 U
Benzo(g,h,i)perylene	400 U	2600 U	2600 U	2600 U	330 U	330 U
Tributylphosphate	400 U	310 J	580 J	660 J	330 U	330 U

000012 4/7/02

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

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Lionville Laboratory, Inc.
Semivolatiles by GC/MS, Special List

Report Date: 11/19/01 13:36

RFW Batch Number: 0111L256

Client: TNU-HANFORD B02-008

Work Order: 11343606001

Page: 2a

Cust ID: SBLKJD BSD

Sample Information
RFW#: 011E1329-MB1
Matrix: SOIL
D.F.: 1.00
Units: ug/Kg

Surrogate	Recovery	Units	%
Nitrobenzene-d5		ug/Kg	95 %
2-Fluorobiphenyl			86 %
p-Terphenyl-d14			113 %
Phenol-d5			90 %
2-Fluorophenol			85 %
2,4,6-Tribromophenol			87 %
Phenol			87 %
bis(2-Chloroethyl) ether			330 U
2-Chlorophenol			90 %
1,3-Dichlorobenzene			330 U
1,4-Dichlorobenzene			75 %
1,2-Dichlorobenzene			330 U
2-Methylphenol			330 U
2,2'-oxybis(1-Chloropropane)			330 U
4-Methylphenol			330 U
N-Nitroso-Di-n-propylamine			101 %
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			75 %
Naphthalene			330 U
4-Chloroaniline			330 U
Hexachlorobutadiene			330 U
4-Chloro-3-methylphenol			96 %
2-Methylnaphthalene			330 U
Hexachlorocyclopentadiene			330 U
2,4,6-Trichlorophenol			330 U
2,4,5-Trichlorophenol			830 U

000014

pc 4/1/02

* = Outside of EPA CLP QC limits.

5

RFW#: 01LE1329-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	87	%
2,4-Dinitrophenol	830	U
4-Nitrophenol	96	%
Dibenzofuran	330	U
2,4-Dinitrotoluene	98	* %
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	92	%
Phenanthrene	330	U
Anthracene	330	U
Carbazole	330	U
Di-n-Butylphthalate	330	U
Fluoranthene	330	U
Pyrene	111	%
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
Dibenzo(a,h)anthracene	330	U
Benzo(g,h,i)perylene	330	U
Tributylphosphate	330	U

0000 *[Signature]* 4/7/02

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

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000016



Client: TNU-HANFORD B02-008
LVL #: 0111L256
SDG/SAF #: H1568, H1571/B02-008

W.O. #: 11343-606-001-9999-00
Date Received: 11-02-2001

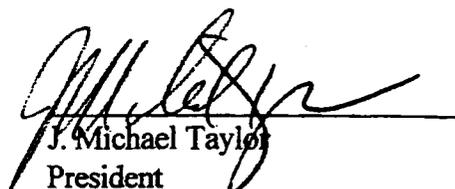
SEMIVOLATILE

Two (2) soil samples were collected on 10-30,31-2001.

The samples and their associated QC samples were extracted on 11-05-2001 and analyzed according to criteria set forth in Lionville Laboratory OPs based on SW 846 Method 8270C for TCL and Tributylphosphate Semivolatile target compounds on 11-16-2001.

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

1. The cooler temperatures upon receipt have been recorded on the chain-of-custody.
2. Samples were extracted and analyzed within required holding time.
3. Non-target compounds were detected in the samples.
4. Sample B13CK9 and its associated matrix spike samples required a 5-fold dilution due to high levels of both target and non-target compounds.
5. All surrogate recoveries were within EPA QC limits.
6. Four (4) of twenty-two (22) blank spike recoveries were outside EPA QC limits.
7. All matrix spike recoveries were within EPA QC limits.
8. Internal standard area and retention time criteria were met.
9. 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

11/21/01
Date

son\group\data\bna\tnu-hanford-0111-256.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 15 pages.

000027

02

Lionville Laboratory, Inc.
 BNA ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B02-008



DATE RECEIVED: 11/02/01

LVL LOT # :0111L256

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13C81	001	S	01LE1329	10/30/01	11/05/01	11/16/01
B13CK9	002	S	01LE1329	10/31/01	11/05/01	11/16/01
B13CK9	002 MS	S	01LE1329	10/31/01	11/05/01	11/16/01
B13CK9	002 MSD	S	01LE1329	10/31/01	11/05/01	11/16/01
LAB QC:						
SBLKJD	MB1	S	01LE1329	N/A	11/05/01	11/16/01
SBLKJD	MB1 BS	S	01LE1329	N/A	11/05/01	11/16/01
SBLKJD	MB1 BSD	S	01LE1329	N/A	11/05/01	11/16/01

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Appendix 5

Data Validation Supporting Documentation

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: _____

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: _____

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 under one

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: 7 April 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: Radiochemistry - Data Package No. H1571-ES (SDG No. H1571)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1571-ES prepared by Eberline Services (ES). 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
B13CK9	10/31/01	Soil	C	See note 1

1-Gross alpha; gross beta; carbon-14; neptunium-237; curium-242; total strontium; americium-241; isotopic uranium, plutonium and thorium; gamma spectroscopy; total uranium.

Data validation was conducted in accordance with the BHI validation statement of work and the **200-CS-1 Work Plan (DOE/RL-99-44, Rev 0)**. Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

- **Holding Times**

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

All holding times were acceptable.

- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field Blank

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% (80-120% for gamma analytes). 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%, tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

All accuracy results were acceptable.

- **Laboratory Duplicates**

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

Due to an RPDs outside QC limits, all thorium-228(aspec) and thorium-228(gea)

results were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate

No field duplicates were submitted for analysis.

- **Detection Levels**

Reported analytical detection levels are compared against the **200-CS-1 Work Plan** PQLs to ensure that laboratory detection levels meet the required criteria. The Europium-152, europium-154 and europium-155 results were reported above the PQL. Under the BHI statement of work, no qualification is required. All other reported laboratory results were reported at or below the analyte-specific PQL.

- **Completeness**

Data package No. H1571-ES (SDG No. H1571) 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 an RPDs outside QC limits, all thorium-228(aspec) and thorium-228(gea) results were qualified as estimates and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

The Europium-152, europium-154 and europium-155 results were reported above the PQL.

REFERENCES

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

200-CS-1 Work Plan (DOE/RL-99-44, Rev 0).

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

Appendix 2

Summary of Data Qualification

000007

DATA QUALIFICATION SUMMARY

SDG: H1571	REVIEWER: TLI	DATE: 4/7/02	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Thorium-228(aspec) Thorium-228(gea)	J	All	RPD

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Project: BECHTEL-HANFORD		Case		SDG: H1571	
Laboratory: EB		Sample Number		B13CK9	
Remarks		Sample Date		10/31/01	
Radiochemistry	CRDL	Q	Result	Q	Result
Gross Alpha	10		27.9		
Gross Beta	15		78.2		
Carbon-14			0.406 U		
Total Strontium	1		0.739		
Thorium-228			1.00 J		
Thorium-230			0.423		
Thorium-232	1		0.560		
Total Uranium (ug/kg)	1000		0.778		
Uranium-233	1		1.19		
Uranium-235	1		0.439		
Uranium-238	1		0.726		
Neptunium-237	1		0.018 U		
Plutonium-238	1		0.303		
Plutonium-239/240	1		25.8		
Curium-242			0 U		
Americium-241	1		1.90		
Potassium-40			10.4		
Tin-126			U U		
Sodium-22			U U		
Cobalt 60	0.1		U U		
Antimony-125			1.67		
Barium-133			U U		
Cesium-134			U U		
Cesium-137	0.5		98.4		
Radium-226			0.788		
Radium-228	0.2		0.662		
Europium-152	0.1		U U		
Europium-154	0.1		U U		
Europium-155	0.1		U U		
Thorium-228			0.386 J		
Thorium-232			0.662		
Uranium-235(gea)			U U		
Uranium-238(gea)			U U		
Americium-241(gea)	1		2.22		

000010

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H1571

R111019-01

B13CK9

DATA SHEET

SDG <u>7134</u>	Client/Case no <u>Hanford</u>	SDG <u>H1571</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R111019-01</u>	Client sample id <u>B13CK9</u>	
Dept sample id <u>7134-001</u>	Location/Matrix <u>200 East and West</u>	<u>SOLID</u>
Received <u>11/02/01</u>	Collected/Weight <u>10/31/01 07:50</u>	<u>859.6 g</u>
% solids <u>64.5</u>	Custody/SAF No <u>B02-008-02</u>	<u>B02-008</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Gross Alpha	12587-46-1	27.9	5.9	3.2	10		93A
Gross Beta	12587-47-2	78.2	8.0	9.0	15		93B
Carbon 14	14762-75-5	0.406	2.6	4.3	50	U	C
Total Strontium	SR-RAD	0.739	0.18	0.21	1.0	U J	SR
Thorium 228	14274-82-9	1.00	0.19	0.073			TH
Thorium 230	14269-63-7	0.423	0.20	0.31	1.0	U U	TH
Thorium 232	TH-232	0.560	0.14	0.058	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0.778	0.087	0.019	0.10		U_T
Uranium 233/234	U-233/234	1.19	0.41	0.32	1.0		U
Uranium 235	15117-96-1	0.439	0.24	0.31	1.0	U	U
Uranium 238	U-238	0.726	0.33	0.25	1.0	U	U
Neptunium 237	13994-20-2	0.018	0.028	0.043	1.0	U	NP
Plutonium 238	13981-16-3	0.303	0.074	0.035	1.0	U	PU
Plutonium 239/240	PU-239/240	25.8	1.0	0.044	1.0		PU
Curium 242	15510-73-3	0	0.060	0.23		U	TP
Americium 241	14596-10-2	1.90	0.44	0.18	1.0		TP
Potassium 40	13966-00-2	10.4	1.2	0.76			GAM
Tin 126	SN-126	U		0.31		U	GAM
Sodium 22	13966-32-0	U		0.095		U	GAM
Cobalt 60	10198-40-0	U		<u>0.067</u>	0.050	U U	GAM
Antimony 125	14234-35-6	1.67	0.74	0.98			GAM
Barium 133	13981-41-4	U		0.30		U	GAM
Cesium 134	13967-70-9	U		0.097		U	GAM
Cesium 137	10045-97-3	98.4	0.80	<u>0.41</u>	0.10		GAM
Radium 226	13982-63-3	0.788	0.38	<u>0.48</u>	0.10		GAM
Radium 228	15262-20-1	0.662	0.26	<u>0.28</u>	0.20		GAM
Europium 152	14683-23-9	U		<u>0.79</u>	0.10	U	GAM
Europium 154	15585-10-1	U		<u>0.27</u>	0.10	U	GAM

200 Area Source Chara. 200-CS-1 OU

000011

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>01/04/02</u>

EBERLINE SERVICES / RICHMOND
 SAMPLE DELIVERY GROUP H1571

R111019-01

B13CK9

DATA SHEET, cont

SDG <u>7134</u>	Client/Case no <u>Hanford</u>	<u>SDG H1571</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R111019-01</u>	Client sample id <u>B13CK9</u>	
Dept sample id <u>7134-001</u>	Location/Matrix <u>200 East and West</u>	<u>SOLID</u>
Received <u>11/02/01</u>	Collected/Weight <u>10/31/01 07:50</u>	<u>859.6 g</u>
% solids <u>64.5</u>	Custody/SAF No <u>B02-008-02</u>	<u>B02-008</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Europium 155	14391-16-3	U		<u>0.52</u>	0.10	U	GAM
Thorium 228	14274-82-9	0.386	0.26	0.37		J	GAM
Thorium 232	TH-232	0.662	0.26	0.28			GAM
Uranium 235	15117-96-1	U		0.78		U	GAM
Uranium 238	U-238	U		9.4		U	GAM
Americium 241	14596-10-2	2.22	0.49	0.70			GAM

200 Area Source Chara. 200-CS-1 OU

pc
4/7/02

000012

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>01/04/02</u>

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H1571 was composed of one solid (soil) sample designated under SAF No. B02-008 with a Project Designation of: 200 Area Source Characterization 200-CS-1 OU – Waste Management.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-Fax on January 4, 2002.

2.0 ANALYSIS NOTES

2.1 Gross Alpha and Gross Beta Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.4 Isotopic Thorium Analyses

The Th-228 RPD between sample B13CK9 and its sample duplicate was 77%, greater than the 3σ limit of 61%. No other problems were encountered during the course of the analyses.

2.5 Total Uranium Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Uranium Analyses

The U-235 RPD between sample B13CK9 and its sample duplicate was 161%, greater than the 3σ limit of 149%. The difference between sample B13CK9 and its sample duplicate was less than the RDL (1.0 pCi/g) for U-235. No other problems were encountered during the course of the analyses.

2.7 Neptunium-237 Analyses

No problems were encountered during the course of the analyses.

2.8 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.9 Transuranic Analyses (Am-241 and Cm-242)

No problems were encountered during the course of the analyses.

2.10 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
Program Manager



Date

Appendix 5
Data Validation Supporting Documentation

000017

APPENDIX A

RADIOCHEMICAL DATA VALIDATION CHECKLIST

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 200-CS-1	DATA PACKAGE: H1571				
VALIDATOR: TL1	LAB: ES		DATE: 30 Mar 02		
CASE:	SDG: H1571				
ANALYSES PERFORMED					
Gross Alpha/Beta	Strontium-90	Technetium-99	Alpha Spectroscopy	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium	CUR 242 XR 237		
SAMPLES/MATRIX Sol					
B13 CKS					

1. Completeness N/A

Technical verification forms present? Yes No N/A

Comments: _____

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

Instruments/detectors calibrated? Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

AF

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)..... N/A

Calibration checked within required frequency?Yes No N/A
Calibration check acceptable?.....Yes No N/A
Calibration check standards traceable?.....Yes No N/A
Calibration check standards expired?Yes No N/A
Calculation check acceptable?Yes No N/A

Comments: _____

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

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

Comments: _____

000019

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

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: _____

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: _____

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: th 228 th 250 th 228 ant - (250) (372)

7L gas gas 130 gas 78

27M24 228 10A

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: _____

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: CS 151 EU 152/154/155 - over

Appendix 6

Additional Documentation Requested by Client

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H1571

R111019-03

Method Blank

METHOD BLANK

SDG <u>7134</u>	Client/Case no <u>Hanford</u>	SDG <u>H1571</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R111019-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7134-003</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B02-008</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Gross Alpha	12587-46-1	-0.314	1.6	3.4	10	U	93A
Gross Beta	12587-47-2	0.356	5.3	8.9	15	U	93B
Carbon 14	14762-75-5	2.31	3.0	4.9	50	U	C
Total Strontium	SR-RAD	-0.009	0.11	0.22	1.0	U	SR
Thorium 228	14274-82-9	0.023	0.046	0.18		U	TH
Thorium 230	14269-63-7	-0.068	0.18	0.39	1.0	U	TH
Thorium 232	TH-232	0	0.046	0.17	1.0	U	TH
Total Uranium (ug/g)	7440-61-1	0	0.001	0.002	0.10	U	U_T
Uranium 233/234	U-233/234	0.095	0.13	0.24	1.0	U	U
Uranium 235	15117-96-1	0.038	0.077	0.29	1.0	U	U
Uranium 238	U-238	0.032	0.063	0.24	1.0	U	U
Neptunium 237	13994-20-2	-0.003	0.020	0.040	1.0	U	NP
Plutonium 238	13981-16-3	0	0.009	0.035	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.005	0.009	0.035	1.0	U	PU
Curium 242	15510-73-3	0	0.053	0.20		U	TP
Americium 241	14596-10-2	0.053	0.11	0.20	1.0	U	TP
Potassium 40	13966-00-2	U		0.15		U	GAM
Tin 126	SN-126	U		0.019		U	GAM
Sodium 22	13966-32-0	U		0.017		U	GAM
Cobalt 60	10198-40-0	U		0.017	0.050	U	GAM
Antimony 125	14234-35-6	U		0.030		U	GAM
Barium 133	13981-41-4	U		0.013		U	GAM
Cesium 134	13967-70-9	U		0.018		U	GAM
Cesium 137	10045-97-3	U		0.013	0.10	U	GAM
Radium 226	13982-63-3	U		0.027	0.10	U	GAM
Radium 228	15262-20-1	U		0.064	0.20	U	GAM
Europium 152	14683-23-9	U		0.032	0.10	U	GAM
Europium 154	15585-10-1	U		0.052	0.10	U	GAM
Europium 155	14391-16-3	U		0.033	0.10	U	GAM

200 Area Source Chara. 200-CS-1 OU

000025

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>01/04/02</u>

EBERLINE SERVICES / RICHMOND
 SAMPLE DELIVERY GROUP H1571

R111019-03

Method Blank

BLANK, cont.

SDG <u>7134</u>	Client/Case no <u>Hanford</u>	<u>SDG H1571</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R111019-03</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7134-003</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B02-008</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Thorium 228	14274-82-9	U		0.021		U	GAM
Thorium 232	TH-232	U		0.064		U	GAM
Uranium 235	15117-96-1	U		0.056		U	GAM
Uranium 238	U-238	U		2.0		U	GAM
Americium 241	14596-10-2	U		0.053		U	GAM

200 Area Source Chara. 200-CS-1 OU

QC-BLANK 40445

000076

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>01/04/02</u>

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H1571

R111019-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7134</u> Contact <u>Melissa C. Mannion</u>	Client/Case no <u>Hanford</u> SDG H1571 Case no <u>No. 630</u>
Lab sample id <u>R111019-02</u> Dept sample id <u>7134-002</u>	Client sample id <u>Lab Control Sample</u> Material/Matrix <u>SOLID</u> SAF No <u>B02-008</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	213	15	3.8	10		93A	215	8.6	99	68-132	70-130
Gross Beta	237	11	7.4	15		93B	239	9.6	99	76-124	70-130
Carbon 14	9780	200	29	50		C	11300	450	87	85-115	80-120
Total Strontium	22.8	0.56	0.14	1.0		SR	22.9	0.92	100	83-117	80-120
Thorium 230	45.2	2.9	0.41	1.0		TH	44.8	1.8	101	86-114	80-120
Total Uranium (ug/g)	18.9	2.1	0.019	0.10		U_T	18.1	0.72	104	77-123	80-120
Uranium 233/234	18.5	2.1	1.1	1.0		U	19.3	0.77	96	81-119	80-120
Uranium 235	15.9	1.9	0.27	1.0		U	15.7	0.63	101	79-121	80-120
Uranium 238	19.9	2.2	1.0	1.0		U	21.0	0.84	95	82-118	80-120
Neptunium 237	22.3	0.88	0.027	1.0		NP	21.8	0.87	102	89-111	80-120
Plutonium 238	25.7	1.1	0.046	1.0		PU	27.2	1.1	94	89-111	80-120
Plutonium 239/240	28.4	1.1	0.036	1.0		PU	29.0	1.2	98	89-111	80-120
Curium 244	21.8	2.4	0.25	1.0		TP	21.6	0.86	101	81-119	80-120
Americium 241	21.5	2.4	0.25	1.0		TP	21.0	0.84	102	80-120	80-120
Cobalt 60	2.02	0.10	0.049	0.050		GAM	1.83	0.073	110	73-127	80-120
Cesium 137	2.32	0.095	0.065	0.10		GAM	2.13	0.085	109	74-126	80-120

200 Area Source Chara. 200-CS-1 OU

QC-LCS 40444

000007

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-LCS</u>
Version <u>3.06</u>
Report date <u>01/04/02</u>

EBERLINE SERVICES/RICHMOND
SAMPLE DELIVERY GROUP H1571

B13CK9

R111019-04

DUPLICATE

SDG <u>7134</u>		Client/Case no <u>Hanford</u>	SDG <u>H1571</u>
Contact <u>Melissa C. Mannion</u>		Case no <u>No. 630</u>	
DUPLICATE	ORIGINAL		
Lab sample id <u>R111019-04</u>	Lab sample id <u>R111019-01</u>	Client sample id <u>B13CK9</u>	
Dept sample id <u>7134-004</u>	Dept sample id <u>7134-001</u>	Location/Matrix <u>200 East and West</u>	<u>SOLID</u>
	Received <u>11/02/01</u>	Collected/Weight <u>10/31/01 07:50</u>	<u>859.6 g</u>
% solids <u>64.5</u>	% solids <u>64.5</u>	Custody/SAF No <u>B02-008-02</u>	<u>B02-008</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	27.0	6.0	4.1	10		93A	27.9	5.9	3.2		3	63	
Gross Beta	78.8	7.4	7.5	15		93B	78.2	8.0	9.0		1	38	
Carbon 14	1.60	2.8	4.6	50	U	C	0.406	2.6	4.3	U	-	-	
Total Strontium	0.835	0.17	0.19	1.0	J	SR	0.739	0.18	0.21	J	12	52	
Thorium 228	0.446	0.22	0.17			TH	1.00	0.19	0.073		<u>77</u>	61	
Thorium 230	0.089	0.22	0.38	1.0	U	TH	0.423	0.20	0.31	J	130	175	
Thorium 232	0.776	0.27	0.17	1.0	J	TH	0.560	0.14	0.058	J	32	69	
Total Uranium (ug/g)	0.718	0.080	0.019	0.10		U_T	0.778	0.087	0.019		8	30	
Uranium 233/234	0.891	0.090	0.030	1.0	J	U	1.19	0.41	0.32		29	61	
Uranium 235	0.048	0.025	0.019	1.0	J	U	0.439	0.24	0.31	J	<u>161</u>	149	
Uranium 238	0.879	0.090	0.026	1.0	J	U	0.726	0.33	0.25	J	19	65	
Neptunium 237	0.020	0.024	0.044	1.0	U	NP	0.018	0.028	0.043	U	-	-	
Plutonium 238	0.273	0.072	0.034	1.0	J	PU	0.303	0.074	0.035	J	10	55	
Plutonium 239/240	24.6	0.99	0.034	1.0		PU	25.8	1.0	0.044		5	14	
Curium 242	0	0.069	0.27		U	TP	0	0.060	0.23	U	-	-	
Americium 241	1.74	0.45	0.21	1.0		TP	1.90	0.44	0.18		9	53	
Potassium 40	10.6	0.63	0.31			GAM	10.4	1.2	0.76		2	37	
Tin 126	U		0.18		U	GAM	U		0.31	U	-	-	
Sodium 22	U		0.044		U	GAM	U		0.095	U	-	-	
Cobalt 60	U		0.047	0.050	U	GAM	U		<u>0.067</u>	U	-	-	
Antimony 125	2.38	0.40	0.52			GAM	1.67	0.74	0.98		35	70	
Barium 133	U		0.17		U	GAM	U		0.30	U	-	-	
Cesium 134	U		0.084		U	GAM	U		0.097	U	-	-	
Cesium 137	104	0.50	<u>0.11</u>	0.10		GAM	98.4	0.80	<u>0.41</u>		6	32	
Radium 226	0.807	0.16	<u>0.19</u>	0.10		GAM	0.788	0.38	<u>0.48</u>		2	84	
Radium 228	0.777	0.14	0.13	0.20		GAM	0.662	0.26	<u>0.28</u>		16	69	
Europium 152	U		<u>0.38</u>	0.10	U	GAM	U		<u>0.79</u>	U	-	-	
Europium 154	U		<u>0.13</u>	0.10	U	GAM	U		<u>0.27</u>	U	-	-	

200 Area Source Chara. 200-CS-1 OU

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>01/04/02</u>

000028

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H1571

B13CK9

R111019-04

DUPLICATE, cont.

SDG <u>7134</u>	Client/Case no <u>Hanford</u>	SDG <u>H1571</u>
Contact <u>Melissa C. Mannion</u>	Case no <u>No. 630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R111019-04</u>	Lab sample id <u>R111019-01</u>	Client sample id <u>B13CK9</u>
Dept sample id <u>7134-004</u>	Dept sample id <u>7134-001</u>	Location/Matrix <u>200 East and West</u> <u>SOLID</u>
	Received <u>11/02/01</u>	Collected/Weight <u>10/31/01 07:50</u> <u>859.6 g</u>
% solids <u>64.5</u>	% solids <u>64.5</u>	Custody/SAF No <u>B02-008-02</u> <u>B02-008</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
Europium 155	U		<u>0.28</u>	0.10	U	GAM	U		<u>0.52</u>	U	-		
Thorium 228	0.877	0.19	0.24			GAM	0.386	0.26	0.37		78	84	
Thorium 232	0.777	0.14	0.13			GAM	0.662	0.26	0.28		16	69	
Uranium 235	U		0.41		U	GAM	U		0.78	U	-		
Uranium 238	U		4.7		U	GAM	U		9.4	U	-		
Americium 241	2.62	0.37	0.50			GAM	2.22	0.49	0.70		17	50	

200 Area Source Chara. 200-CS-1 OU

QC-DUP#1 40446

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>3.06</u>
Report date <u>01/04/02</u>

000029

Date: 7 April 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: PCB - Data Package No. H1571-LLI (SDG No. H1571)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1571-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
B13CK9	10/31/01	Soil	C	PCBs by 8082

Data validation was conducted in accordance with the BHI validation statement of work and the **200-CS-1 Work Plan (DOE/RL-99-44, Rev 0)**. Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times for PCB analysis is assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements is 14 days to extraction and 40 days for analysis.

All holding times were acceptable.

- **Blanks**

Method Blanks

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

All method blank results were acceptable.

Field Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate and must be within control limits of 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". Nondetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

All matrix spike recovery 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". Nondetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Nondetected compounds with surrogate recoveries above the upper control limit require no qualification.

Due to the surrogate being diluted out, all PCB results were qualified as estimates and flagged "J".

All other surrogate recovery 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 +/-35%. 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 results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the **200-CS-1 Work Plan** PQLs to ensure that laboratory detection levels meet the required criteria. All undetected PCB results exceeded the PQL. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H1571-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 surrogate being diluted out, all PCB results were qualified as estimates and

flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All undetected PCB results exceeded the PQL. 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.

200-CS-1 Work Plan (DOE/RL-99-44, Rev 0).

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

DATA QUALIFICATION SUMMARY

SDG: H1571	REVIEWER: TLI	DATE: 4/7/02	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	Surogate diluted out

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Lionville Laboratory, Inc.

PCBs by GC

Report Date: 11/13/01 12:23

RFW Batch Number: 0111L256

Client: TNU-HANFORD B02-008

Work Order: 11343606001

Page: 1

Cust ID: B13C81 B13C81 B13C81 B13CK9 B13KVD B13KVD BS

Sample Information
 RFW#: 001 MS
 Matrix: SOIL
 D.F.: 1.00
 Units: UG/KG

Surrogate:	001 MS	001 MSD	002	011E1330-MB1	011E1330-MB1	SOIL	SOIL	SOIL	UG/KG	UG/KG	UG/KG	UG/KG
Tetrachloro-m-xylene	85	62	D	92	95	†	†	†	†	†	†	†
Decachlorobiphenyl	84	92	D	91	93	†	†	†	†	†	†	†
Aroclor-1016	40	40	2600	33	33	U	U	U	U	U	U	U
Aroclor-1221	81	81	5100	67	67	U	U	U	U	U	U	U
Aroclor-1232	40	40	2600	33	33	U	U	U	U	U	U	U
Aroclor-1242	40	40	2600	33	33	U	U	U	U	U	U	U
Aroclor-1248	40	40	2600	33	33	U	U	U	U	U	U	U
Aroclor-1254	40	90	9400	33	89	U	U	U	U	U	U	U
Aroclor-1260	40	40	2600	33	33	U	U	U	U	U	U	U

Cust ID: PBLKVD BSD

Sample Information
 RFW#: 011E1330-MB1
 Matrix: SOIL
 D.F.: 1.00
 Units: UG/KG

Surrogate:	011E1330-MB1	011E1330-MB1	SOIL	SOIL	UG/KG	UG/KG
Tetrachloro-m-xylene	92	90	†	†	†	†
Decachlorobiphenyl	90	90	†	†	†	†
Aroclor-1016	33	33	U	U	U	U
Aroclor-1221	67	67	U	U	U	U
Aroclor-1232	33	33	U	U	U	U
Aroclor-1242	33	33	U	U	U	U
Aroclor-1248	33	33	U	U	U	U
Aroclor-1254	81	81	†	†	†	†
Aroclor-1254	81	81	†	†	†	†
Aroclor-1260	33	33	U	U	U	U

Handwritten: PBLKVD
3/30/02

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

Handwritten: 11/13/01

000000

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



Analytical Report

Client: TNU HANFORD B02-008
LVL#: 0111L256
SDG/SAF#: H1568/H1571/B02-008

W.O.#: 11343-606-001-9999-00
Date Received: 11-02-01

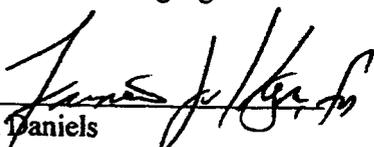
PCB

The set of samples consisted of two (2) soil samples collected on 10-30,31-01.

The samples and their associated QC samples were extracted on 11-05-01 and analyzed according to Lionville Laboratory OPs based on SW846, 3rd Edition procedures on 11-09,10,12-01. The extraction procedure was based on method 3540 and the extracts were analyzed based on method 8082 for Aroclors only.

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 cooler temperatures have been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis have been met.
3. The samples and their associated QC samples received a sulfuric acid and a sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All obtainable 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. Sample B13CK9 required a fifty-fold instrument dilution due to the high concentrations of target analytes. 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.
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.


Iain Daniels
Deputy Laboratory Manager
Lionville Laboratory Incorporated


Date

pefr:\group\data\pest\11L-256.pcb

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 9 pages.

000023



Lionville Laboratory, Inc.
PCB ANALYTICAL DATA PACKAGE FOR
TNU-HANFORD B02-008 H1568/H1571

DATE RECEIVED: 11/02/01

LVL LOT # :0111L256

CLIENT ID	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13C81	001	S	01LE1330	10/30/01	11/05/01	11/10/01
B13C81	001 MS	S	01LE1330	10/30/01	11/05/01	11/10/01
B13C81	001 MSD	S	01LE1330	10/30/01	11/05/01	11/10/01
B13CK9	002	S	01LE1330	10/31/01	11/05/01	11/12/01

LAB QC:

PBLKVD	MB1	S	01LE1330	N/A	11/05/01	11/09/01
PBLKVD	MB1 BS	S	01LE1330	N/A	11/05/01	11/09/01
PBLKVD	MB1 BSD	S	01LE1330	N/A	11/05/01	11/09/01

File 11/3/01

000011A

Appendix 5

Data Validation Supporting Documentation

000015

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	200 ASC 2005-1		DATA PACKAGE: H1571		
VALIDATOR:	FLI	LAB: LL1	DATE: 30 Mar 02		
CASE:			SDG: H1571		
ANALYSES PERFORMED					
SW-846 8081	SW-846 8081 (TCLP)	<u>SW-846 8082</u>	SW-846 8081 (TCLP)		
SAMPLES/MATRIX	B13CK9				soil

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

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

Initial calibrations acceptable? Yes No N/A
 Continuing calibrations acceptable? Yes No N/A
 Standards traceable? Yes No N/A
 Standards expired? Yes No N/A
 Calculation check acceptable? Yes No N/A
 DDT and endrin breakdowns acceptable? Yes No N/A

Comments: _____

PESTICIDE/PCB DATA VALIDATION CHECKLIST

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

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

Comments: _____

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

- Surrogates analyzed? Yes No N/A
- Surrogate recoveries acceptable? Yes No N/A
- Surrogates traceable? (Levels D, E) Yes No N/A
- Surrogates expired? (Levels D, E) Yes No N/A
- MS/MSD samples analyzed? Yes No N/A
- MS/MSD results acceptable? Yes No N/A
- MS/MSD standards NIST traceable? (Levels D, E) Yes No N/A
- MS/MSD standards expired? (Levels D, E) Yes No N/A
- LCS/BSS samples analyzed? Yes No N/A
- LCS/BSS results acceptable? Yes No N/A
- Standards traceable? (Levels D, E) Yes No N/A
- Standards expired? (Levels D, E) Yes No N/A
- Transcription/calculation errors? (Levels D, E) Yes No N/A
- Performance audit sample(s) analyzed? Yes No N/A
- Performance audit sample results acceptable? Yes No N/A

Comments: Surr deluded out - ~~equal~~ J

PESTICIDE/PCB DATA VALIDATION CHECKLIST

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

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

Comments: _____

6. SYSTEM PERFORMANCE (Levels D and E)

- Chromatographic performance acceptable? Yes No N/A
- Positive results resolved acceptably? Yes No N/A

Comments: _____

7. HOLDING TIMES (all levels)

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

Comments: _____

PESTICIDE/PCB DATA VALIDATION CHECKLIST

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

Compound identification acceptable? (Levels D, E) Yes No N/A
Compound quantitation acceptable? (Levels D, E) Yes No N/A
Results reported for all requested analyses? Yes No N/A
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 undetected over TDL

9. SAMPLE CLEANUP (Levels D and E)

Fluorilicil ® (or other aborbant) 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: _____

Date: 7 April 2002
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management
Subject: Inorganics - Data Package No. H1571-LLI (SDG No. H1571)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H1571-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
B13CK9	10/31/01	Soil	C	See note 1

1-ICP metals by 6010B; mercury by 7470A.

Data validation was conducted in accordance with the BHI validation statement of work and the **200-CS-1 Work Plan (DOE/RL-99-44, Rev 0)**. Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times for ICP metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements is six (6) months for ICP metals and 28 days for mercury.

All holding times were acceptable.

- **Blanks**

Preparation (Method) 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 target required quantitation limit (PQL), 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 IDL and less than or equal to the PQL, 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 Blanks

No field blanks were submitted for analysis, therefore, no field blank data was available for review.

- **Accuracy**

Matrix Spike

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

All matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within relative percent difference (RPD) limits of plus or minus 30% for soil samples. If RPD values are out of specification and the sample concentration is greater than five times the PQL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the PQL and the sample concentration is less than five times the PQL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for laboratory duplicates are an RPD less than 30% for positive sample results greater than five times the PQL or plus or minus 2 times the PQL for positive sample results less than five times the PQL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

Due to an RPD of 43%, the TCLP lead result was qualified as an estimate and flagged "J".

Due to an RPD of 30.1%, the boron result was qualified as an estimate and flagged "J".

All other laboratory duplicate results were acceptable.

Field Duplicate Samples

No field duplicates were submitted for analysis.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the **200-CS-1 Work Plan** project quantitation limits (PQL) to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific PQL.

- **Completeness**

Data package No. H1571-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 an RPD of 30.1%, the boron result was qualified as an estimate and flagged "J". Due to an RPD of 43%, the TCLP lead result was qualified as an estimate and flagged "J". Data flagged 'J' is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

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

200-CS-1 Work Plan (DOE/RL-99-44, Rev 0).

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

DATA QUALIFICATION SUMMARY

SDG: H1571	REVIEWER: TLI	DATE: 4/7/02	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Boron TCLP Lead	J	All	RPD

000008

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

INORGANIC ANALYSIS, SOIL MATRIX, (MG/KG)

Project: BECHTEL-HANFORD		Case		Sample Number		Remarks	
Laboratory: Lionville Laboratory Inc.		SDG: H1571		B13CK9			
Sample Date	CRDL	Result	Q	Result	Q	Result	Q
Inorganics							
Silver	2	42.0					
Aluminum		8370					
Arsenic	1	5.8					
Boron		3.4 J					
Barium	20	83.0					
Beryllium	0.5	0.01 U					
Bismuth		0.47 U					
Calcium		9880					
Cadmium	0.5	28.0					
Chromium (total)	1	36.8					
Copper	2.5	172					
Iron		26800					
Mercury	0.2	5.2					
Potassium		1650					
Manganese		216					
Molybdenum		3.2					
Sodium		873					
Nickel	4	27.6					
Lead	10	75.3					
Selenium	10	0.99					
Thallium		0.41 U					
Vanadium	5	41.3					
Zinc	2	224					
Inorganics - TCLP	CRDL	Result	Q				
Cadmium*		449					
Mercury*		0.10 U					
Lead*		22.9 J					
*-Units UG/L							

000000

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 11/13/01

LVL LOT #: 01111256

T: TNJ-HANFORD B02-008

ORDER: 11343-606-001-9999-00

SR	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
	B13CK9	Silver, Total	42.0	MG/KG	0.09	1.0
		Aluminum, Total	8370	MG/KG	2.1	1.0
		Arsenic, Total	5.8	MG/KG	0.47	1.0
		Boron, Total	3.4	MG/KG	0.27	1.0
		Barium, Total	83.0	MG/KG	0.01	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Bismuth, Total	0.47 u	MG/KG	0.47	1.0
		Calcium, Total	9880	MG/KG	1.3	1.0
		Cadmium, Total	28.0	MG/KG	0.04	1.0
		Chromium, Total	36.8	MG/KG	0.09	1.0
		Chromium, Total	172	MG/KG	0.07	1.0
		Copper, Total	26800	MG/KG	2.6	1.0
		Iron, Total	5.2	MG/KG	0.12	5.0
		Mercury, Total	1650	MG/KG	2.9	1.0
		Potassium, Total	216	MG/KG	0.01	1.0
		Manganese, Total	3.2	MG/KG	0.16	1.0
		Molybdenum, Total	873	MG/KG	0.53	1.0
		Sodium, Total	27.6	MG/KG	0.15	1.0
		Nickel, Total	75.3	MG/KG	0.28	1.0
		Lead, Total	0.99	MG/KG	0.33	1.0
		Selenium, Total	0.41 u	MG/KG	0.41	1.0
		Thallium, Total	41.3	MG/KG	0.07	1.0
		Vanadium, Total	224	MG/KG	0.04	1.0
		Zinc, Total				

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 02/01/02

CLIENT: TNUHANFORD B02-008 H1571
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0201L841

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-002	B13CK9	Cadmium, TCLP Leachate	449	UG/L	1.8	6.0
		Mercury, TCLP Leachate	0.10	UG/L	0.10	1.0
		Lead, TCLP Leachate	22.9	UG/L	13.2	6.0

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Analytical Report

Client: TNU-HANFORD B02-008
LVL#: 0111L256
SDG/SAF#: H1568/H1571/B02-008

W.O.#: 11343-606-001-9999-00
Date Received: 11-02-01

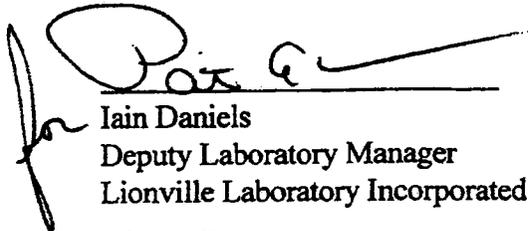
METALS CASE NARRATIVE

1. This narrative covers the analyses of 2 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. All cooler temperatures have been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits with the exception of the final CCV for Nickel. All samples were surrounded by QC in control.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The matrix spike (MS) recoveries for 4 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. A serial dilution is performed for Mercury. 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 17 pages.

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u>	
		<u>Concentration (ppb)</u>	<u>% Recovery</u>
B13C81	Aluminum	20,000	100.3
	Calcium	30,000	123.3
	Iron	30,000	107.7
	Manganese	1000	115.2

12. The duplicate analyses for 2 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
 Deputy Laboratory Manager
 Lionville Laboratory Incorporated
 gmb/ml1-256

11-15-01
 Date



000015

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B02-008

LVL LOT # :01111256

DATE RECEIVED: 11/02/01

ELEMENT ID / ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
ARSENIC, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
ARSENIC, TOTAL	001	S	01C0352	10/30/01	11/08/01	11/08/01
MERCURY, TOTAL	001 REP	S	01C0352	10/30/01	11/08/01	11/08/01
MERCURY, TOTAL	001 MS	S	01C0352	10/30/01	11/08/01	11/08/01
MERCURY, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
POTASSIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
POTASSIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
POTASSIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
MANGANESE, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
MANGANESE, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
MANGANESE, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
LYBDENUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
LYBDENUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
LYBDENUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
DIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
DIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
DIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
CKEL, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
CKEL, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
CKEL, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
AD, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
AD, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
AD, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
ELENIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
ELENIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
ELENIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
HALLIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
HALLIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
HALLIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
ANADIUM, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
ANADIUM, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
ANADIUM, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
INC, TOTAL	001 REP	S	01L0730	10/30/01	11/08/01	11/08/01
INC, TOTAL	001 MS	S	01L0730	10/30/01	11/08/01	11/08/01
INC, TOTAL	001	S	01L0730	10/30/01	11/08/01	11/08/01
13CK9						
SILVER, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B02-008

LVL LOT # :0111L256

E RECEIVED: 11/02/01

ENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MINUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
ENIC, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
ON, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
IUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
YLLIUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
MUTH, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
CIUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
MIUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
OMIUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
PER, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
ON, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
UCURY, TOTAL	002	S	01C0352	10/31/01	11/08/01	11/09/01
PASSIUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
NGANESE, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
YBDENUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
DIUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
CKEL, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
AD, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
LENIUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
ALLIUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
NADIUM, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01
NC, TOTAL	002	S	01L0730	10/31/01	11/08/01	11/08/01

QC:

LVER LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
LVER, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
UMINUM LABORTORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
UMINUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
SENIC LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
SENIC, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
RON LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
RON, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
ARIUM LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
ARIUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
RYLLIUM LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
RYLLIUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
ISMUTH, LCS	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01

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Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNU-HANFORD B02-008

RECEIVED: 11/02/01

LVL LOT # :0111L256

ELEMENT ID / ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
MUTH, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
CIUM LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
CIUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
MIUM LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
MIUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
OMIUM LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
OMIUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
PER LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
PER, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
IN LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
IN, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
UCURY LABORATORY	LC1 BS	S	01C0352	N/A	11/08/01	11/08/01
UCURY, TOTAL	MB1	S	01C0352	N/A	11/08/01	11/08/01
ASSIUM LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
ASSIUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
GANESE LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
GANESE, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
YBDENUM LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
YBDENUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
DIUM LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
DIUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
CKEL LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
CKEL, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
AD LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
AD, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
LENIUM LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
LENIUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
ALLIUM LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
ALLIUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
NADIUM LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
NADIUM, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01
NC LABORATORY	LC1 BS	S	01L0730	N/A	11/08/01	11/08/01
NC, TOTAL	MB1	S	01L0730	N/A	11/08/01	11/08/01

000018



Analytical Report

Client: TNU-HANFORD B02-008
LVL#: 0201L841
SDG/SAF#: H1571/B02-008

W.O.#: 11343-606-001-9999-00
Date Received: 01-24-02

METALS CASE NARRATIVE

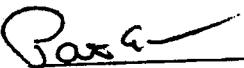
1. This narrative covers the analysis of 1 TCLP leachate sample.
2. The sample was prepared and analyzed in accordance with methods checked on the attached glossary. The sample was reported with a six fold dilution due to sample matrix.

This is a relog of LVL batch# 0112L256-002 per SDR# 02PM004.
3. All analyses were performed within the required holding times.
4. All cooler temperatures have been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
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 duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
11. The TCLP extract from sample B13CK9 was selected for the matrix spike (MS) for this analytical batch. All MS recoveries were greater than 50% as per method criteria.

000029

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 12 pages.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.



Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated
gmb/m01-841

02-01-02
Date

Lionville Laboratory, Inc.
 INORGANIC ANALYTICAL DATA PACKAGE FOR
 TNUHANFORD B02-008 H1571



DATE RECEIVED: 01/24/02

LVL LOT # :0201L841

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B13CK9						
TCLP	001	S	02LTO170	10/31/01	01/29/02	01/30/02
CADMIUM, TCLP LEACHA	002	W	02L0044	01/30/02	01/31/02	01/31/02
CADMIUM, TCLP LEACHA	002 REP	W	02L0044	01/30/02	01/31/02	01/31/02
CADMIUM, TCLP LEACHA	002 MS	W	02L0044	01/30/02	01/31/02	01/31/02
MERCURY, TCLP LEACHA	002	W	02C0037	01/30/02	01/30/02	01/31/02
MERCURY, TCLP LEACHA	002 REP	W	02C0037	01/30/02	01/30/02	01/31/02
MERCURY, TCLP LEACHA	002 MS	W	02C0037	01/30/02	01/30/02	01/31/02
LEAD, TCLP LEACHATE	002	W	02L0044	01/30/02	01/31/02	01/31/02
LEAD, TCLP LEACHATE	002 REP	W	02L0044	01/30/02	01/31/02	01/31/02
LEAD, TCLP LEACHATE	002 MS	W	02L0044	01/30/02	01/31/02	01/31/02

LAB QC:

CADMIUM LABORATORY	LC1 BS	W	02L0044	N/A	01/31/02	01/31/02
CADMIUM, TCLP LEACHA	MB1	W	02L0044	N/A	01/31/02	01/31/02
CADMIUM, TCLP LEACHA	MB2	W	02L0044	N/A	01/31/02	01/31/02
MERCURY LABORATORY	LC1 BS	W	02C0037	N/A	01/30/02	01/31/02
MERCURY, TOTAL	MB1	W	02C0037	N/A	01/30/02	01/31/02
MERCURY, TCLP LEACHA	MB2	W	02C0037	N/A	01/30/02	01/31/02
LEAD LABORATORY	LC1 BS	W	02L0044	N/A	01/31/02	01/31/02
LEAD, TCLP LEACHATE	MB1	W	02L0044	N/A	01/31/02	01/31/02
LEAD, TCLP LEACHATE	MB2	W	02L0044	N/A	01/31/02	01/31/02

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Appendix 5
Data Validation Supporting Documentation

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

ALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	2005-1		DATA PACKAGE: H1571		
VALIDATOR:	TLI	LAB:	DATE: 3 Apr 02		
CASE:			SDG: H1571		
ANALYSES PERFORMED					
<u>SW-846/ICP</u>	SW-846/GFAA	<u>SW-846/Hg</u>	SW-846 Cyanide		
+TCLP					
SAMPLES/MATRIX	BIBCKS			soil	

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: _____

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

- MS/MSD samples analyzed?..... Yes No N/A
- MS/MSD results acceptable?..... Yes ~~No~~ ~~N/A~~
- MS/MSD standards NIST traceable? (Levels D, E)..... Yes No N/A
- MS/MSD standards expired? (Levels D, E)..... Yes No N/A
- LCS/BSS samples analyzed?..... Yes No N/A
- LCS/BSS results acceptable?..... Yes No N/A
- Standards traceable? (Levels D, E)..... Yes No N/A
- Standards expired? (Levels D, E)..... Yes No N/A
- Transcription/calculation errors? (Levels D, E)..... Yes No N/A
- Performance audit sample(s) analyzed?..... Yes No N/A
- Performance audit sample results acceptable?..... Yes No N/A

Comments: Duran 30:1 70 J all
TCLP Lead 4370 Jay

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: Baron 3070 Jcd
TCLP Lead 4390 Jcd

6. ICP QUALITY CONTROL (Levels D and E)

- ICP serial dilution samples analyzed? Yes No N/A
- ICP serial dilution %D values acceptable? Yes No N/A
- ICP post digestion spike required? Yes No N/A
- ICP post digestion spike values acceptable? Yes No N/A
- Standards traceable? Yes No N/A
- Standards expired? Yes No N/A
- Transcription/calculation errors? Yes No N/A

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

- Duplicate injections performed as required? Yes No N/A
- Duplicate injection %RSD values acceptable? Yes No N/A
- Analytical spikes performed as required? Yes No N/A
- Analytical spike recoveries acceptable? Yes No N/A
- Standards traceable? Yes No N/A
- Standards expired? Yes No N/A
- MSA performed as required? Yes No N/A
- MSA results acceptable? Yes No N/A
- Transcription/calculation errors? Yes No N/A

Comments: _____

8. HOLDING TIMES (all levels)

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

- Results reported for all requested analyses? Yes No N/A
- 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: _____

Appendix 6

Additional Documentation Requested by Client

000028

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 11/13/01

LVL LOT #: 0111L256

AGENT: TNU-HANFORD B02-008

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

AMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	01L0730-MB1	Silver, Total	0.06 u	MG/KG	0.06	1.0
		Aluminum, Total	4.2	MG/KG	1.4	1.0
		Arsenic, Total	0.32 u	MG/KG	0.32	1.0
		Boron, Total	0.52	MG/KG	0.18	1.0
		Barium, Total	0.07	MG/KG	0.01	1.0
		Beryllium, Total	0.01	MG/KG	0.01	1.0
		Bismuth, Total	0.32 u	MG/KG	0.32	1.0
		Calcium, Total	2.7	MG/KG	0.89	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.11	MG/KG	0.06	1.0
		Copper, Total	0.12	MG/KG	0.05	1.0
		Iron, Total	1.7 u	MG/KG	1.7	1.0
		Potassium, Total	8.3	MG/KG	1.9	1.0
		Manganese, Total	0.02	MG/KG	0.01	1.0
		Molybdenum, Total	0.11 u	MG/KG	0.11	1.0
		Sodium, Total	7.5	MG/KG	0.36	1.0
		Nickel, Total	0.10 u	MG/KG	0.10	1.0
		Lead, Total	0.19 u	MG/KG	0.19	1.0
		Selenium, Total	0.22 u	MG/KG	0.22	1.0
		Thallium, Total	0.28 u	MG/KG	0.28	1.0
		Vanadium, Total	0.05 u	MG/KG	0.05	1.0
		Zinc, Total	0.15	MG/KG	0.03	1.0
BLANK1	01C0352-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

000029

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 11/13/01

LVL LOT #: 0111L256

NT: TNU-HANFORD B02-008

ORDER: 11343-606-001-9999-00

FILE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
	B13C81	Silver, Total	5.4	0.07u	6.1	88.5	1.0
		Aluminum, Total	11000	10100	243	376.4*	1.0
		Arsenic, Total	227	12.1	243	88.4	1.0
		Boron, Total	107	3.1	122	85.2	1.0
		Barium, Total	330	118	243	87.5	1.0
		Beryllium, Total	5.4	0.08	6.1	87.2	1.0
		Bismuth, Total	557	0.39u	608	91.7	1.0
		Calcium, Total	28800	24300	3040	148.7*	1.0
		Cadmium, Total	5.5	0.27	6.1	85.8	1.0
		Chromium, Total	33.0	11.8	24.3	87.2	1.0
		Copper, Total	48.9	19.5	30.4	96.7	1.0
		Iron, Total	25500	26400	122	-790. *	1.0
		Mercury, Total	0.20	0.02u	0.20	101.0	1.0
		Potassium, Total	5470	2260	3040	105.4	1.0
		Manganese, Total	489	454	60.8	57.4*	1.0
		Molybdenum, Total	106	0.53	122	86.5	1.0
		Sodium, Total	3600	550	3040	100.5	1.0
		Nickel, Total	65.3	12.5	60.8	86.8	1.0
		Lead, Total	63.9	11.7	60.8	85.9	1.0
		Selenium, Total	207	0.27u	243	85.0	1.0
		Thallium, Total	206	0.52	243	84.4	1.0
		Vanadium, Total	104	52.9	60.8	84.4	1.0
		Zinc, Total	106	54.1	60.8	85.0	1.0

000020

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 11/13/01

CLIENT: TNU-HANFORD B02-008
 WORK ORDER: 11343-606-001-9999-80

LVL LOT #: 0111L256

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
001REP	B13C81	Silver, Total	0.07u	0.07u	NC	1.0
		Aluminum, Total	10100	10600	4.2	1.0
		Arsenic, Total	12.1	12.5	3.3	1.0
		Boron, Total	3.1	4.2	30.1	1.0
		Barium, Total	118	122	3.2	1.0
		Beryllium, Total	0.08	0.10	27.1	1.0
		Bismuth, Total	0.39u	0.39u	NC	1.0
		Calcium, Total	24300	24800	2.2	1.0
		Cadmium, Total	0.27	0.26	4.2	1.0
		Chromium, Total	11.8	12.0	1.7	1.0
		Copper, Total	19.5	19.4	0.51	1.0
		Iron, Total	26400	26700	0.83	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Potassium, Total	2260	2350	3.6	1.0
		Manganese, Total	454	460	1.5	1.0
		Molybdenum, Total	0.53	0.49	7.2	1.0
		Sodium, Total	550	598	8.4	1.0
		Nickel, Total	12.5	12.5	0.00	1.0
		Lead, Total	11.7	11.7	0.00	1.0
		Selenium, Total	0.27u	0.27u	NC	1.0
		Thallium, Total	0.52	0.57	9.3	1.0
		Vanadium, Total	52.9	53.1	0.38	1.0
		Zinc, Total	54.1	54.4	0.55	1.0

000001

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 02/01/02

CLIENT: TNUHANFORD B02-008 H1571
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0201L841

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	02L0044-MB1	Cadmium, TCLP Leachate	0.30	u UG/L	0.30	1.0
		Lead, TCLP Leachate	2.2	u UG/L	2.2	1.0
BLANK2	02L0044-MB2	Cadmium, TCLP Leachate	1.8	u UG/L	1.8	6.0
		Lead, TCLP Leachate	13.2	u UG/L	13.2	6.0
BLANK1	02C0037-MB1	Mercury, Total	0.10	u UG/L	0.10	1.0
BLANK2	02C0037-MB2	Mercury, TCLP Leachate	0.10	u UG/L	0.10	1.0

000022

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 02/01/02

LVL LOT #: 0201L841

CLIENT: TNUHANFORD B02-008 H1571

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-002	B13CK9	Cadmium, TCLP Leachate	1460	449	1000	101.1	6.0
		Mercury, TCLP Leachate	180	0.10u	200	89.8	50.0
		Lead, TCLP Leachate	5060	22.9	5000	100.7	6.0

000023

~~8~~

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 02/01/02

CLIENT: TNUHANFORD B02-008 H1571
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0201L841

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE RPD		
-002REP	B13CK9	Cadmium, TCLP Leachate	449	459	2.2	6.0
		Mercury, TCLP Leachate	0.10u	0.10u	NC	1.0
		Lead, TCLP Leachate	22.9	14.8	43.0	6.0

000024

10

Fukumoto, Joyce A

From: Cearlock, Christopher S
Sent: Wednesday, May 08, 2002 3:27 PM
To: Fukumoto, Joyce A
Subject: RE: Validation Package H1571
No problem!

-----Original Message-----
From: Fukumoto, Joyce A
Sent: Wednesday, May 08, 2002 8:53 AM
To: Cearlock, Christopher S
Subject: Validation Package H1571

Chris,

The charge to change the reference to the 200-CS-1 Work Plan (DOR/RL-99-44, Rev 0) is going to be \$40.

Are you okay with that?

Joyce Fukumoto
372-9262

Fukumoto, Joyce A

From: Fukumoto, Joyce A
Sent: Wednesday, May 08, 2002 3:28 PM
To: 'Christian, Bruce'
Subject: RE: Validation Package H1571

Bruce,

Please go ahead with the change.

Thanks
Joyce

-----Original Message-----

From: Christian, Bruce [mailto:BChristian@TechLawInc.com]
Sent: Tuesday, May 07, 2002 7:28 PM
To: 'Fukumoto, Joyce A '
Subject: RE: Validation Package H1571

The cost is \$38.81. Also, see attached

-----Original Message-----

From: Fukumoto, Joyce A
To: 'Bchristian@TechLawInc.com'
Sent: 5/7/02 5:52 PM
Subject: Validation Package H1571
Importance: High

Bruce,

We would like for data validation package H1571 to reference the 200-CS-1 Work Plan (DOE/RL-99-44, Rev 0), not the 216-A-29 Ditch SAI. Although the VSR did not state for this to be done, we would still like the change to be made to the package. However, before this is done, we would like to get an estimate of what the cost associated with the change would be.

Thank You

Joyce Fukumoto
372-9262

Duncan, Jeanette M

From: Cearlock, Christopher S
Sent: Wednesday, April 10, 2002 9:45 AM
To: Duncan, Jeanette M
Cc: Weiss, Richard L
Subject: Review of Data Validation Package H1571

Jeanette,

Here are a couple of comments on the Draft Data Validation Package H1571. The package should look identical to that of Validation Set H1568.

1. Global Comment. The data validation packages should reference the 200-CS-1 Work Plan (DOE/RL-99-44, Rev 0), not the 216-A-29 Ditch SAI. *not necessary to the USR*
2. Wet Chemistry Data Package - There is no note 2 identified. However, it should read "Nitrate not validated per BHI instructions (SAF B02-008)." Qualifiers different than H1568. *can be*
3. SemiVoa Package - should "Tributylphosphate" be added to the first sentence of **Minor Deficiencies?** *NO*
4. Inorganics - Lead flagged for J on H1571 but not H1568. Don't they have the same RPDs? *1571 is HCLP Lead*
5. Volatiles - Should the methylene chloride be qualified as "U" because of method blank contamination. It is currently qualified as a "J" *can be*

That's it.

Thanks
Chris

Validation Services Request

VSR No.: B02-011
Rev: 0

Validator: TechLaw	Date Initiated: 3/15/2002
Project Coordinator: TRENT, SJ	QAPP Number:
Client: CEARLOCK, CS	SAP Number:
Project: 200-CS-1	Level of Validation (A,B,C,D,E): C
SAF Number(s): B02-008	Data Package(s): H1571

Validation Task Title: 200 Area Source Characterization 200-CS-1 OU - Waste Management

Validation Procedure/Revision Number	Chem: BHI-01435 Rev. 0
to be utilized in validation:	Rad: BHI-01433 Rev. 0

Comments:

Also, please validate in accordance with BHI-01562 (attached previously to VSR B02-004).

Requested Validation Start Date

3/15/2002

Requested Validation Completion Date

4/5/2002

Duncan, Jeanette M

From: Weiss, Richard L
Sent: Thursday, April 18, 2002 11:06 AM
To: Duncan, Jeanette M
Subject: Review of Validation Packages for SDG H1571

Jeanette,

Here are my comments from the review of the validation packages for SDG H1571

Wet Chem, Gasoline/DRO, VOA, Semi-VOA, PCBs: No Comments

Inorganic: Page 1; Correct "IC anions" to "ICP metals" under table

Page10: "J" qualifiers not applied to Boron and TCLP Lead results.

Rad: Page 3, 8, 10; Results for Th-230 and Sb-125 are less than 5 times MDAs. Validation criteria for these should be difference <2 times MDA not <30% RPD. Results shouldn't be qualified. Qualification for results for Th-228 (both aspect and gea) ok but criteria should be difference > 2 times MDA not RPD.

Page 3,4; Cs-137 was a detect, failure to meet RDL not an issue.

Let me know if you need anything else.

Rich

***Fukumoto, Joyce A**

From: Fukumoto, Joyce A
Sent: Monday, May 13, 2002 3:58 PM
To: 'Christian, Bruce'
Cc: Fukumoto, Joyce A
Subject: RE: Validation Package H1571

Bruce

Rich checked with the project on this. The validation criteria specified in the 216-A-29 Ditch documentation (BHI-01562) were cloned from the master document for CS-1 (DOE/RL-99-44, Rev.0). Therefore, the change should be able to be made with no concerns for "different" validation criteria.

Joyce

-----Original Message-----

From: Christian, Bruce [mailto:BChristian@TechLawInc.com]
Sent: Sunday, May 12, 2002 9:21 PM
To: 'Fukumoto, Joyce A '
Subject: RE: Validation Package H1571

Actually, I think I have to take back my yes answer. I validated to a specific set of instructions, and I don't see how I can change the reference after the fact. (sorry I had this little brainstorm this late, but it hit me as I was changing the references that I couldn't do that)

-----Original Message-----

From: Fukumoto, Joyce A
To: 'Christian, Bruce'
Sent: 5/8/02 6:27 PM
Subject: RE: Validation Package H1571

Bruce,

Please go ahead with the change.

Thanks
Joyce

-----Original Message-----

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The cost is \$38.81. Also, see attached

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an
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Thank You

Joyce Fukumoto
372-9262

Review Comment Record (RCR)

<p>1. Date 04/19/02</p> <p>2. Review No. BHI/QA2010</p>	
<p>3. Project 200-CS-1</p> <p>4. Page Page 2 of 2</p>	

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
9	Inorganic: Page 10, page title WSoil, should eliminate the "W". Also, the Laboratory should be Lionville Laboratory, Inc. not Recra LabNet.		<i>Car</i>	
10	Volatile: Holding Times, refers to water samples. This should describe the holding time criteria for soil samples.		<i>Car</i>	
11	Volatile: Page 10, numerous of the qualifiers have an apostrophes associated with them. It should be noted as to what these apostrophes mean.		<i>Car</i>	

Review Comment Record (RCR)

1. Date 04/19/02	2. Review No. BHI/QA2010
3. Project 200-CS-1	4. Page Page 1 of 2

5. Document Number(s)/Title(s) SDG No.: H01571	6. Program/Project/ Building Number 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management	7. Reviewer Claude Stacey	8. Organization/Group BHI/QA	9. Location/Phone H0-16/372-9208
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10. Agreement with indicated comment disposition(s) 11. CLOSED

17. Comment Submittal Approval: _____ Date: _____

Reviewer/Point of Contact:  Date: **05/03/02**
 Reviewer/Point of Contact: _____ Date: _____

Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	General Comment: There are no chain of custody included in any of the reports except radiochemistry.		close 	
2	Wet Chemistry: Page 1 and 2, Holding Times, refers to ICP. This should be IC.		close 	
3	Wet chemistry: Page 10, cyanide and pH have apostrophes associated with them. There should be an explanation as to what these apostrophes mean.		close 	
4	Wet Chemistry: Page 10, heading has laboratory as Recra LabNet. This should be Lionville Laboratory, Inc.		close 	
5	Gasoline & Diesel Range Organics: Page 10, page heading should be Gasoline/Diesel Range Organics ...		close 	
6	Radiochemistry: Total Uranium has units as ug/L. This should be ug/kg. In addition, it should be noted that the CRDL is in MG/KG.		close 	
7	PCB: No chain of custody			
8	Semivolatile: Page 11, the SDG is identified as H1568. The SDG should be H1571. In addition the sample description is B13C81. The sample should be B13CK9.		close 	

Review Comment Record (RCR)

	1. Date 04/19/02	2. Review No. BHI/QA2010
	3. Project 200-CS-1	4. Page Page 1 of 2

5. Document Number(s)/Title(s) SDG No.: H01571	6. Program/Project/ Building Number 200 Area Source Characterization 200-CS-1 Operable Unit - Waste Management	7. Reviewer Claude Stacey	8. Organization/Group BHI/QA	9. Location/Phone H0-16/372-9208
---	---	----------------------------------	-------------------------------------	---

17. Comment Submittal Approval: _____ 11. CLOSED

10. Agreement with indicated comment disposition(s)

Organization Manager (Optional) _____ Date _____ Reviewer/Point of Contact _____

Author/Originator _____ Date _____ Reviewer/Point of Contact _____

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4	Wet Chemistry: Page 10, heading has laboratory as Recra LabNet. This should be Lionville Laboratory, Inc.			
5	Gasoline & Diesel Range Organics: Page 10, page heading should be Gasoline/Diesel Range Organics ...			
6	Radiochemistry: Total Uranium has units as ug/L. This should be ug/kg. In addition, it should be noted that the CRDL is in MG/KG.			
7	PCB: No chain of custody			
8	Semivolatiles: Page 11, the SDG is identified as H1568. The SDG should be H1571. In addition the sample description is B13C81. The sample should be B13CK9.			

Review Comment Record (RCR)

	1. Date 04/19/02	2. Review No. BHI/QA2010
	3. Project 200-CS-1	4. Page Page 2 of 2

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That's it.

Thanks
Chris

