

SAF-B05-027
600-47 Verification
FINAL VALIDATION PACKAGE

COMPLETE COPY OF VALIDATION PACKAGE TO:

Jeanette Duncan

2 copies clipped

JMD / *8-3-05*
INITIAL DATE

COMMENTS:

SDG H3171

SAF-B05-027

Sample Location/Waste Site: 600-47

RECEIVED
SEP 01 2005

EDMC

Date: 8 July 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 600-47 Verification
Subject: Inorganics - Data Package No. H3171

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3171 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
J036X2	5/25/05	Soil	C	ICP Metals by 6010B
J036X3	5/25/05	Soil	C	ICP Metals by 6010B
J036X4	5/25/05	Soil	C	ICP Metals by 6010B
J036X5	5/25/05	Soil	C	ICP Metals by 6010B
J036X6	5/25/05	Soil	C	ICP Metals by 6010B

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 1, May 2004). Appendices 1 through 6 provide the following information as indicated below:

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

DATA QUALITY PARAMETERS

· Holding Times

Analytical holding times for metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within 28 days for mercury and 6 months for ICP metals.

All holding times were acceptable.

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· Preparation (Method) Blanks

Preparation Blanks

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

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

All preparation blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

· Accuracy

Matrix Spike and Laboratory Control Sample

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

All accuracy results were acceptable.

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· **Precision**

Laboratory Duplicate Samples

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

All laboratory duplicate results were acceptable.

Field Duplicate

One set of field duplicates (J036X2/J036X6) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

· **Analytical Detection Levels**

Reported analytical detection levels are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All analytes met the RQL.

· **Completeness**

Data package No. H3171 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

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REFERENCES

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

DOE/RL-2001-48, Rev. 1, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

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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).

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Appendix 2

Summary of Data Qualification

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METALS DATA QUALIFICATION SUMMARY*

SDG: H3171	REVIEWER: TLI	PROJECT: 600-47 Verification	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: BECHTEL-HANFORD												
Laboratory: LLI												
Case		SDG: H3171										
Sample Number		J036X2		J036X3		J036X4		J036X5		J036X6		
Remarks												
Sample Date		5/25/05		5/25/05		5/25/05		5/25/05		5/25/05		
Inorganics		RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Arsenic			1.8		2.3		1.7		1.9		2.0	
Barium			55.6		65.9		50.0		67.0		61.5	
Beryllium			0.42		0.49		0.40		0.50		0.49	
Cadmium			0.09		0.09		0.06		0.09		0.06	
Chromium			3.9		5.0		4.2		5.5		4.8	
Lead			2.4		3.3		2.9		3.5		2.7	

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Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 06/09/05

CLIENT: TNUHANFORD B05-027 H3171
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0505L604

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	J036X2	Arsenic, Total	1.8	MG/KG	0.39	1.0
		Barium, Total	55.6	MG/KG	0.02	1.0
		Beryllium, Total	0.42	MG/KG	0.009	1.0
		Cadmium, Total	0.09	MG/KG	0.03	1.0
		Chromium, Total	3.9	MG/KG	0.06	1.0
		Lead, Total	2.4	MG/KG	0.22	1.0
-002	J036X3	Arsenic, Total	2.3	MG/KG	0.34	1.0
		Barium, Total	65.9	MG/KG	0.02	1.0
		Beryllium, Total	0.49	MG/KG	0.008	1.0
		Cadmium, Total	0.09	MG/KG	0.02	1.0
		Chromium, Total	5.0	MG/KG	0.05	1.0
		Lead, Total	3.3	MG/KG	0.19	1.0
-003	J036X4	Arsenic, Total	1.7	MG/KG	0.34	1.0
		Barium, Total	50.0	MG/KG	0.02	1.0
		Beryllium, Total	0.40	MG/KG	0.008	1.0
		Cadmium, Total	0.06	MG/KG	0.02	1.0
		Chromium, Total	4.2	MG/KG	0.05	1.0
		Lead, Total	2.9	MG/KG	0.19	1.0
-004	J036X5	Arsenic, Total	1.9	MG/KG	0.41	1.0
		Barium, Total	67.0	MG/KG	0.02	1.0
		Beryllium, Total	0.50	MG/KG	0.009	1.0
		Cadmium, Total	0.09	MG/KG	0.03	1.0
		Chromium, Total	5.5	MG/KG	0.06	1.0
		Lead, Total	3.5	MG/KG	0.23	1.0
-005	J036X6	Arsenic, Total	2.0	MG/KG	0.41	1.0
		Barium, Total	62.5	MG/KG	0.02	1.0
		Beryllium, Total	0.49	MG/KG	0.009	1.0
		Cadmium, Total	0.06	MG/KG	0.03	1.0
		Chromium, Total	4.8	MG/KG	0.06	1.0
		Lead, Total	2.7	MG/KG	0.23	1.0

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Analytical Report

Client: TNU-HANFORD B05-027
LVL#: 0505L604
SDG/SAF#: H3171/B05-027

W.O.#: 11343-606-001-9999-00
Date Received: 05-26-05

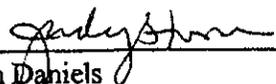
METALS CASE NARRATIVE

1. This narrative covers the analyses of 5 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. All results presented in this report are derived from samples that met LVL's sample acceptance policy.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks (MB) were within method criteria {less than the Practical Quantitation Limit (3X the IDL), MB value less than 5% of the RCRA limit, or samples greater than 20X MB value}. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the 80-120% control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 14 pages.

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12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.
13. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard-copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.
14. LvLI is NELAP accredited by the state of Pennsylvania and holds over 20 additional state accreditations. For a complete listing of accrediting authorities and the corresponding analytes/methods, please contact your Project Manager.


Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

gmb/m05-604

4/21/08
Date



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0505L 604

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B05-027-01		Page 1 of 1				
Collector Fukberg		Company Contact J Lech		Telephone No. 373-5904		Project Coordinator KESSNER, JH		Price Code 8K				
Project Designation 600-47 Verification		Sampling Location 300-FI-2 / 600-47 Dump Area			SAF No. B05-027		Air Quality <input type="checkbox"/>		Data Turnaround 15 Days			
Ice Chest No. ERC02 001, 002		Field Logbook No. EL 1395-10		COA RG60472000		Method of Shipment Fed EX						
Shipped To EBERLINE SERVICES / LIONVILLE		Offsite Property No. A050 222			Bill of Lading/Air Bill No. SEB OSPC							
POSSIBLE SAMPLE HAZARDS/REMARKS Tie To J03048				Preservation None		None						
Special Handling and/or Storage NA H3171				Type of Container		aG						
				No. of Container(s)		1						
				Volume		250mL				60mL		
SAMPLE ANALYSIS				See Item (1) in Special Instructions.		Isotope Uranium						
Sample No.		Matrix *	Sample Date	Sample Time								
1	J036X2	SOIL	5.25.05	0903	X	X						
2	J036X3	SOIL	5.25.05	0912	X	X						
3	J036X4	SOIL	5.25.05	0916	X	X						
4	J036X5	SOIL	5.25.05	0921	X	X						
5	J036X6	SOIL	5.25.05	0903	X	X						
CHAIN OF POSSESSION				Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix *		
Relinquished By/Removed From EAC		Date/Time 5.25.05 1430		Received By/Stored In Fed Ex		(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead); ICP Metals - 6010A (Supertrace Add-On) (Beryllium)				S-Gel SE-Solvent SD-Solid SI-Solid W-Water O-Oil A-Air DS-Dioxin Solids DL-Dioxin Liquids F-Fines W-Wipe L-Liquid V-Vegetation X-Other		
Relinquished By/Removed From Fed Ex		Date/Time 5/26/05 1000		Received By/Stored In Victor Sherman							Date/Time 5/24/05 1000	
Relinquished By/Removed From		Date/Time		Received By/Stored In							Date/Time	
Relinquished By/Removed From		Date/Time		Received By/Stored In							Date/Time	
Relinquished By/Removed From		Date/Time		Received By/Stored In							Date/Time	
Relinquished By/Removed From		Date/Time		Received By/Stored In							Date/Time	
LABORATORY SECTION		Received By		Title		Date/Time						
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By		Date/Time						

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Jul. 21. 2005 12:13PM

No. 1205 P. 1

Appendix 5

Data Validation Supporting Documentation

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	000-47 Veridact		DATA PACKAGE: H3171		
VALIDATOR:	TCI	LAB: LLI	DATE: 7/1/05		
			SDG: H3171		
ANALYSES PERFORMED					
SW-846/ICP	SW-846/GFAA	SW-846/Hg	SW-846 Cyanide		
SAMPLES/MATRIX					
J036X1		J036X2	J036X3	J036X4	
		J036X5	J036X6		
Sod					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Technical verification documentation present? Yes No N/A

Comments: _____

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

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

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

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

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

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

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

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

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

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

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

Comments: _____

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: _____

6. ICP QUALITY CONTROL (Levels D and E)

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

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

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

Comments: _____

8. HOLDING TIMES (all levels)

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

Comments: _____

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

9. RESULT QUANTITATION AND DETECTION LIMITS (all levels)

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

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Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/09/05

CLIENT: INDIANAPOLIS B05-027 H3171
WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0505L604

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	0510312-MB1	Arsenic, Total	0.45 u	MG/KG	0.45	1.0
		Barium, Total	0.14	MG/KG	0.02	1.0
		Beryllium, Total	0.01 u	MG/KG	0.01	1.0
		Cadmium, Total	0.03 u	MG/KG	0.03	1.0
		Chromium, Total	0.07 u	MG/KG	0.07	1.0
		Lead, Total	0.25 u	MG/KG	0.25	1.0

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Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 06/09/05

CLIENT: TNUHANFORD B05-027 H3171
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 0505L604

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	J036X2	Arsenic, Total	163	1.8	188	85.8	1.0
		Barium, Total	226	55.6	188	90.8	1.0
		Beryllium, Total	4.8	0.42	4.7	93.3	1.0
		Cadmium, Total	4.3	0.09	4.7	89.6	1.0
		Chromium, Total	21.9	3.9	18.8	95.7	1.0
		Lead, Total	45.1	2.4	46.9	91.0	1.0

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Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 06/09/05

CLIENT: TNUHANFORD BGS-027 H2171

LVL LOT #: 0505L604

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REF)
			RESULT	REPLICATE	RPO	
-001REP	J036X2	Arsenic, Total	1.8	2.0	10.5	1.0
		Barium, Total	55.6	58.8	5.6	1.0
		Beryllium, Total	0.42	0.49	16.0	1.0
		Cadmium, Total	0.09	0.09	0.53	1.0
		Chromium, Total	3.9	4.8	20.7	1.0
		Lead, Total	2.4	3.1	25.5	1.0

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Lionville Laboratory, Inc.

INORGANICS LABORATORY CONTROL STANDARDS REPORT 06/09/05

CLIENT: TNUHANFORD B05-027 H3171
 WORK ORDER: 11343-606-001-9999-00

LVL LOT #: 05051604

SAMPLE	SITE ID	ANALYTE	SPIKED	SPIKED	UNITS	%RECOV
			SAMPLE	AMOUNT		
LCS1	05L0312-LC1	Arsenic, LCS	955	1000	MG/KG	95.5
		Barium, LCS	481	500	MG/KG	96.2
		Beryllium, LCS	25.0	25.0	MG/KG	100
		Cadmium, LCS	24.6	25.0	MG/KG	98.4
		Chromium, LCS	49.3	50.0	MG/KG	98.6
		Lead, LCS	247	250	MG/KG	99.0

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Date: 8 July 2005
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 600-47 Verification
Subject: Radiochemistry - Data Package No. H3171

INTRODUCTION

This memo presents the results of data validation on Data Package No. H3171 prepared by Eberline Services (EB). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
J036X2	5/25/05	Soil	C	See note 1
J036X3	5/25/05	Soil	C	See note 1
J036X4	5/25/05	Soil	C	See note 1
J036X5	5/25/05	Soil	C	See note 1
J036X6	5/25/05	Soil	C	See note 1

1 - Alpha spectroscopy (isotopic uranium).

Data validation was conducted in accordance with the Bechtel Hanford Incorporated (BHI) validation statement of work and the 300 Area Remedial Action Sampling and Analysis Plan (DOE/RL-2001-48, Rev. 1, May 2004). Appendices 1 through 6 provide the following information as indicated below:

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- 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.

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- **Preparation (Method) Blanks**

Laboratory Blanks

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

All blank results were acceptable.

Field (Equipment) Blank

No field blanks were submitted for analysis.

- **Accuracy**

Accuracy is evaluated from laboratory control sample (LCS) or blank spike sample (BSS) batch samples and spiked samples from the analytical batch. Measured activities are compared to the known added amounts. The acceptable LCS or BSS and matrix spike (MS) recovery range is 70-130%. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, or not qualified, depending on the activity of the individual sample. Results are rejected for LCS/BSS recoveries of less than 30% and tracer recoveries of less than 20%, and tracer recoveries of greater than 115% for detected results.

All accuracy results were acceptable.

- **Laboratory Duplicates**

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

is less than or equal to two times the CRDL. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicates

One set of field duplicates (J036X2/J036X6) were submitted for analysis. Field duplicates are compared using the same criteria as for laboratory duplicates. All field duplicate results were acceptable.

· **Detection Levels**

Reported analytical detection levels for undetected analytes are compared against the remaining waste sites RQLs to ensure that laboratory detection levels meet the required criteria. All reported results met the analyte specific RQL.

· **Completeness**

Data package No. H3171 was submitted for validation and verified for completeness. Completeness is based on the percentage of data determined to be valid (i.e., not rejected). The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

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

DOE/RL-2001-48, Rev. 1, *300 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 2004.

000003

Appendix 1

Glossary of Data Reporting Qualifiers

000004

Qualifiers which may be applied by data validators in compliance with the BHI statement of work are as follows:

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

000005

Appendix 2

Summary of Data Qualification

000006

RADIOCHEMISTRY DATA QUALIFICATION SUMMARY*

SDG: H3171	REVIEWER: TLI	PROJECT: 600-47 Verification	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			

* - The Qualified Data Summary Table includes laboratory applied "U" qualifiers not specifically identified here. The laboratory applied "U" qualifiers are included to minimize misinterpretation of results contained in the table.

000007

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000008

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PC/G)

Project: BECHTEL-HANFORD											
Laboratory: EB											
Case		SDG: H3171									
Sample Number		J036X2		J036X3		J036X4		J036X5		J036X8	
Remarks											Duplicate
Sample Date		5/25/05		5/25/05		5/25/05		5/25/05		5/25/05	
Radiochemistry	RQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Uranium-233/234	1	1.01		0.600		1.31		1.36		0.858	
Uranium-235	1	0.139	U	0	U	0	U	0.022	U	0.030	U
Uranium-238	1	0.665		0.750		1.28		1.58		0.711	

600000

* - RQL exceeded

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

EBERLINE SERVICES / RICHMOND
 SAMPLE DELIVERY GROUP H3171

7832-001

J036X2

DATA SHEET

SDG <u>7832</u>	Client/Case no <u>Hanford</u>	SDG <u>H3171</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R505190-01</u>	Client sample id <u>J036X2</u>	
Dept sample id <u>7832-001</u>	Location/Matrix <u>300-FF-2/600-47 Dump</u>	<u>SOLID</u>
Received <u>05/26/05</u>	Collected/Weight <u>05/25/05 09:03</u>	<u>65.41 g</u>
% solids <u>96.3</u>	Custody/SAF No <u>B05-027-01</u>	<u>B05-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	1.01	0.33	0.18	1.0		U
Uranium 235	15117-96-1	0.139	0.11	0.21	1.0	U	U
Uranium 238	U-238	0.665	0.28	0.18	1.0		U

600-47 Verification

Handwritten signature and date: 7/6/05

000010

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>05/10/05</u>

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H3171

7832-002

J036X3

DATA SHEET

SDG <u>7832</u>	Client/Case no <u>Hanford</u>	SDG <u>H3171</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R505190-02</u>	Client sample id <u>J036X3</u>	
Dept sample id <u>7832-002</u>	Location/Matrix <u>300-FF-2/600-47 Dump</u>	<u>SOLID</u>
Received <u>05/26/05</u>	Collected/Weight <u>05/25/05 09:12</u>	<u>72.24 g</u>
% solids <u>97.2</u>	Custody/SAF No <u>B05-027-01</u>	<u>B05-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	0.600	0.22	0.16	1.0		U
Uranium 235	15117-96-1	0	0.052	0.20	1.0	U	U
Uranium 238	U-238	0.750	0.26	0.16	1.0		U

600-47 Verification

✓
7/6/05

000011

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/10/05</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3171

7832-003

J036X4

DATA SHEET

SDG <u>7832</u>	Client/Case no <u>Hanford</u>	SDG <u>H3171</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R505190-03</u>	Client sample id <u>J036X4</u>	
Dept sample id <u>7832-003</u>	Location/Matrix <u>300-FF-2/600-47 Dump</u>	<u>SOLID</u>
Received <u>05/26/05</u>	Collected/Weight <u>05/25/05 09:16 65.24 g</u>	
% solids <u>97.6</u>	Custody/SAF No <u>B05-027-01</u>	<u>B05-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	1.31	0.36	0.16	1.0		U
Uranium 235	15117-96-1	0	0.052	0.20	1.0	U	U
Uranium 238	U-238	1.29	0.36	0.16	1.0		U

600-47 Verification

W
w/7/05

000012

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>1.06</u>
Report date <u>06/10/05</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3171

7832-004

J036X5

DATA SHEET

SDG <u>7832</u>	Client/Case no <u>Hanford</u>	SDG <u>H3171</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R505190-04</u>	Client sample id <u>J036X5</u>	
Dept sample id <u>7832-004</u>	Location/Matrix <u>300-FF-2/600-47 Dump</u>	<u>SOLID</u>
Received <u>05/26/05</u>	Collected/Weight <u>05/25/05 09:21</u>	<u>63.51 g</u>
% solids <u>97.6</u>	Custody/SAF No <u>B05-027-01</u>	<u>B05-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Uranium 233/234	U-233/234	1.36	0.34	0.14	1.0		U
Uranium 235	15117-96-1	0.022	0.044	0.17	1.0	U	U
Uranium 238	U-238	1.58	0.34	0.14	1.0		U

600-47 Verification

✓
7/6/05

000013

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/10/05</u>

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3171

7832-005

J036X6

DATA SHEET

SDG <u>7832</u>	Client/Case no <u>Hanford</u>	SDG <u>H3171</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R505190-05</u>	Client sample id <u>J036X6</u>	
Dept sample id <u>7832-005</u>	Location/Matrix <u>300-FF-2/600-47 Dump</u>	<u>SOLID</u>
Received <u>05/26/05</u>	Collected/Weight <u>05/25/05 09:03</u>	<u>69.81 g</u>
% solids <u>96.6</u>	Custody/SAF No <u>B05-027-01</u>	<u>B05-027</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0.858	0.30	0.19	1.0		U
Uranium 235	15117-96-1	0.030	0.059	0.23	1.0	U	U
Uranium 238	U-238	0.711	0.25	0.19	1.0		U

600-47 Verification

Handwritten signature
7/6/05

000014

Lab id	<u>EBRLNE</u>
Protocol	<u>Hanford</u>
Version	<u>Ver 1</u>
Form	<u>DVL-DS</u>
Version	<u>3.06</u>
Report date	<u>06/10/05</u>

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000015

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H3171 was composed of five solid (soil) samples designated under SAF No. B05-027 with a Project Designation of: 600-47 Verification.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The results were transmitted to BHI via e-mail on June 10, 2005.

2.0 ANALYSIS NOTES

2.1 Isotopic Uranium Analyses

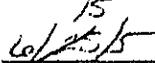
No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

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



Melissa C. Mannion
Senior Program Manager

¹⁵


Date

Bechtel Hanford Inc.		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				B05-027-01		Page 1 of 1	
Collector Fahlberg		Company Contact J Lerch		Telephone No. 373-5904		Project Coordinator KESSNER, JH		Price Code 8K Data Turnaround 15 Days	
Project Designation 600-47 Verification		Sampling Location 300-FF-2 / 600-47 Dump Area H3171 (7832)			SAF No. B05-027		Air Quality <input type="checkbox"/>		
Ice Chest No. 5JG-1		Field Logbook No. EL 1395-10		COA RG60472000		Method of Shipment Fed EX			
Shipped To (EBERLINE SERVICES) LIONVILLE		Offsite Property No. A050204			Bill of Lading/Air Bill No. SEE OSPC				
POSSIBLE SAMPLE HAZARDS/REMARKS Tie To J03048				Preservation	None	None			
Special Handling and/or Storage NA				Type of Container	aG	aG			
				No. of Container(s)	1	1			
				Volume	250ml	60ml			
				See Item (1) in Special Instructions	Isotopic Uranium				
SAMPLE ANALYSIS									
Sample No.	Matrix *	Sample Date	Sample Time						
J036X2	SOIL	5.25.05	0903	X	X				
J036X3	SOIL	5.25.05	0912	X	X				
J036X4	SOIL	5.25.05	0916	X	X				
J036X5	SOIL	5.25.05	0921	X	X				
J036X6	SOIL	5.25.05	0903	X	X				
CHAIN OF POSSESSION				SPECIAL INSTRUCTIONS				Matrix *	
Relinquished By/Removed From EAC Date/Time 1430		Received By/Stored In Fed Ex Date/Time		(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead); ICP Metals - 6010A (Supertrace Add-On) (Beryllium)				S=Soil SF=Soil/Screen SD=Soil SL=Sludge W=Water O=Oil A=As DS=Drum Solids PH=Drum Liquid T=Time WI=Wipe L=Liquid V=Vegetation X=Other	
Relinquished By/Removed From R. Lehman Date/Time 5.25.05		Received By/Stored In JFW Date/Time 05/26/05 9:30							
Relinquished By/Removed From		Received By/Stored In							
Relinquished By/Removed From		Received By/Stored In							
Relinquished By/Removed From		Received By/Stored In							
Relinquished By/Removed From		Received By/Stored In							
LABORATORY SECTION		Received By		Title				Date/Time	
FINAL SAMPLE DISPOSITION		Disposal Method		Disposed By				Date/Time	

Appendix 5

Data Validation Supporting Documentation

000018

**APPENDIX A
RADIOCHEMICAL DATA VALIDATION CHECKLIST**

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	G00-47 Urethane		DATA PACKAGE: H3171		
VALIDATOR:	FLT	LAB:	ES	DATE:	7/11/03
			SDG:	H3171	
ANALYSES PERFORMED					
Gras Alpha/Beta	Strontium-90	Technetium-99	<u>Alpha Spectroscopy</u>	Gamma Spectroscopy	
Total Uranium	Radium-22	Tritium			
SAMPLES/MATRIX					
J036X2		J036X3	J036X4	J036X5	J036X6
Soil					

1. Completeness N/A

Technical verification forms present? Yes No N/A

Comments: _____

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

Instruments/detectors calibrated? Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

Standards Expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

3. Continuing Calibration (Levels D, E)

N/A

Calibration checked within required frequency? Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

4. Background Counts (Levels D, E)

N/A

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

Background Counts acceptable? Yes No N/A

Calculation check acceptable? Yes No N/A

Comments: _____

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

Method blank analyzed within required frequency? Yes No N/A

Method blank results acceptable? Yes No N/A

Analytes detected in method blank? Yes No N/A

Field blank(s) analyzed? Yes No N/A

Field blank results acceptable? Yes No N/A

Analytes detected in field blank(s)? Yes No N/A

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

Comments: no FB

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

LCS /BSS analyzed within required frequency? Yes No N/A

LCS/BSS recoveries acceptable? Yes No N/A

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

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

LCS/BSS levels correct? (Levels D,E) Yes No N/A

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

Comments: _____

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

Chemical carrier added? Yes No N/A

Chemical recovery acceptable? Yes No N/A

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

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: _____

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: _____

Appendix 6

Additional Documentation Requested by Client

000025

EBERLINE SERVICES / RICHMOND
SAMPLE DELIVERY GROUP H3171

7832-007

Method Blank

METHOD BLANK

SDG <u>7832</u>	Client/Case no <u>Hanford</u>	SDG <u>H3171</u>
Contact <u>Melissa C. Mannion</u>	Contract No. <u>630</u>	
Lab sample id <u>R505190-07</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7832-007</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B05-027</u>	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0	0.052	0.20	1.0	U	U
Uranium 235	15117-96-1	0.031	0.063	0.24	1.0	U	U
Uranium 238	U-238	0	0.052	0.20	1.0	U	U

600-47 Verification

QC-BLANK #52995

METHOD BLANKS

Page 1

SUMMARY DATA SECTION

Page 8

000026

Lab id <u>EBRLNE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>08/10/05</u>

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H3171

7832-008

J036X5

DUPLICATE

SDG <u>7832</u>	Client/Case no <u>Hanford</u>	SDG <u>H3171</u>
Contact <u>Melissa C. Mannor</u>	Contract No. <u>630</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>R505190-08</u>	Lab sample id <u>R505190-04</u>	Client sample id <u>J036X5</u>
Dept sample id <u>7832-008</u>	Dept sample id <u>7832-004</u>	Location/Matrix <u>100-FF 2/600-47 Dump</u> <u>SOLID</u>
	Received <u>05/26/05</u>	Collected/Weight <u>05/25/05 28.21 27.91 g</u>
% solids <u>97.6</u>	% solids <u>97.6</u>	Custody/SAP No <u>B05-027-01</u> <u>B05-027</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	RPC %	1σ TOT	PROT LIMIT
Uranium 233/234	1.05	0.28	0.15	1.0		U	1.36	0.34	0.14		26	56	
Uranium 235	0.047	0.047	0.18	1.0	U	U	0.022	0.044	0.17	U			
Uranium 238	0.989	0.28	0.15	1.0		U	1.58	0.34	0.14		46	53	

600-47 Verification

QC-DUP#4 52996

DUPLICATES

Page 1

SUMMARY DATA SECTION

Page 10

000028

Lab id <u>EBERLINE</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DUP</u>
Version <u>1.05</u>
Report date <u>06/26/05</u>