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Date: 17 August 1999
 To: Bechtel Hanford Inc. (technical representative)
 From: TechLaw, Inc.
 Project: 100-BC Areas - Full Protocol - Waste Site 116-B-10
 Subject: Inorganics - Data Package No. H0437-RLN (SDG No. H0437)

RECEIVED
 APR 25 2000

INTRODUCTION

This memo presents the results of data validation on Data Package ~~EDMO~~ H0437-RLN prepared by RECRA LabNet (RLN). 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
BOVFK0	06/10/99	Soil	C	See note 1
BOVFK1	06/10/99	Soil	C	See note 1
BOVFK2	06/10/99	Soil	C	See note 1
BOVFK3	06/10/99	Soil	C	See note 1
BOVFK4	06/10/99	Soil	C	See note 1
BOVFK5	06/10/99	Soil	C	See note 1

1 - ICP metals by 6010A (lead and total chromium); hexavalent chromium by 7196; mercury by 7471

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times 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 six (6)

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months for lead & total chromium; 30 days for chromium VI; and 28 days for mercury.

All holding times were acceptable.

- **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 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 although the target detection limits (TDLs) for lead and chromium VI were exceeded.

Equipment Blank

One equipment blank (BOVFK2) was submitted for analysis. No analytes were detected in the equipment blank although the TDLs for chromium VI and lead were exceeded. Under the BHI statement of work, no qualification is required.

- **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 30% and a sample result

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below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 69% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 130% or less than 70% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 130% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike percent recovery of 26.7%, all detected mercury results were qualified as estimates and flagged "J". Since sample BOVFK2 is an equipment blank, it was not qualified as rejected (per BHI guidelines) in order to preclude the masking of equipment contamination.

All other 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 RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 30% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

- Due to an RPD of 48.2%, all mercury results were qualified as estimates and flagged "J".

- All other laboratory duplicate results were acceptable.

- Field Duplicates

- One sample duplicate pair (BOVFK0/BOVFK1) was submitted for analysis. The samples were compared using the same criteria as for a laboratory duplicate. The RPD for mercury was outside QC limits (35.7%). Under the BHI statement of work, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan TDLs or the CRDL if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The following had reported detection limits above their TDL: Chromium VI in all samples and lead in sample BOVFK2. Under the BHI statement of work, no qualification is required. All other reported laboratory detection levels met the analyte specific TDL or CRDL.

- **Completeness**

Data package No. H0437-RLN (SDG No. H0437) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an RPD of 48.2%, all mercury results were qualified as estimates and flagged "J". Due to a matrix spike percent recovery of 26.7%, all detected mercury 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 following had reported detection limits above their TDL: Chromium VI in all samples and lead in sample BOVFK2. 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.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Interoffice Memorandum 056910, Joan Kessner to Distribution, *Hexavalent Chromium Analytical Holding Time*, 4 March 1998.

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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 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 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 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).

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Appendix 2

Summary of Data Qualification

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DATA QUALIFICATION SUMMARY

SDG: H0437	REVIEWER: TLI	DATE: 8/17/99	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Mercury	J	BOVFK0, BOVFK1, BOVFK3, BOVFK4, BOVFK5	Matrix spike percent recovery
Mercury	J	All	RPD

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Recre LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 06/28/99

CLIENT: TNO-HANFORD B99-002
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9906L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0VFK0	Chromium, Total	9.8	MG/KG	0.32	1.0
		Mercury, Total	0.33 J	MG/KG	0.02	1.0
		Lead, Total	7.5	MG/KG	3.7	1.0
-002	B0VFK1	Chromium, Total	9.6	MG/KG	0.31	1.0
		Mercury, Total	0.23 J	MG/KG	0.02	1.0
		Lead, Total	7.5	MG/KG	3.6	1.0
-003	B0VFK2	Chromium, Total	0.35 u	MG/KG	0.35	1.0
		Mercury, Total	0.02 u J	MG/KG	0.02	1.0
		Lead, Total	4.0 u	MG/KG	4.0	1.0
-004	B0VFK3	Chromium, Total	9.6	MG/KG	0.28	1.0
		Mercury, Total	1.3 J	MG/KG	0.02	1.0
		Lead, Total	7.4	MG/KG	3.3	1.0
-005	B0VFK4	Chromium, Total	23.8	MG/KG	0.24	1.0
		Mercury, Total	0.07 J	MG/KG	0.02	1.0
		Lead, Total	8.0	MG/KG	2.8	1.0
-006	B0VFK5	Chromium, Total	9.7	MG/KG	0.34	1.0
		Mercury, Total	0.15 J	MG/KG	0.02	1.0
		Lead, Total	5.3	MG/KG	3.9	1.0

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FILE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	REPORTING FACTOR
11	BOVPM0	% Solids	97.8	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
12	BOVPM1	% Solids	97.5	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
02	BOVPM2	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
04	BOVPM3	% Solids	97.5	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
05	BOVPM4	% Solids	96.5	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
06	BOVPM5	% Solids	96.6	%	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0

REGRA LOT #: 99061224

ENT: TNU-HANFORD B99-002
 K ORDER: 10985-001-001-9999-00

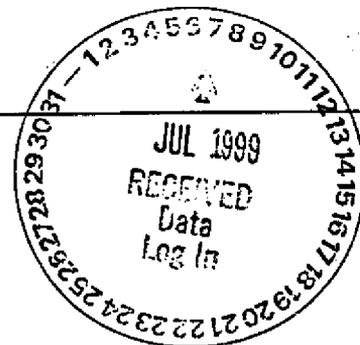
INORGANICS DATA SUMMARY REPORT 06/22/99

Recra Labnet - Lincoln

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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**Recra LabNet Philadelphia
Analytical Report**

**Client : TNU-HANFORD B99-002
RFW# : 9906L224
SDG/SAF# : H0437/B99-002**

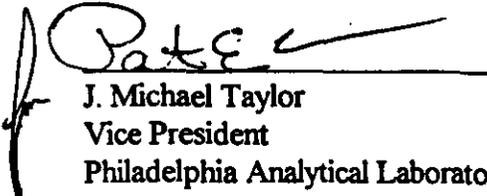
**W.O.# : 10985-001-001-9999-00
Date Received: 06-15-99**

METALS CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.
2. Samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. The cooler temperature has been recorded on the Chain of Custody.
5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within the 90-110% control limits.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits (less than the PQL).
7. All preparation/method blanks were within method criteria (less than the Practical Quantitation Limit (3X the IDL) 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 laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report. A serial dilution was performed for Mercury.
11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

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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.


J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory
jjw/m06-224

6-29-99
Date



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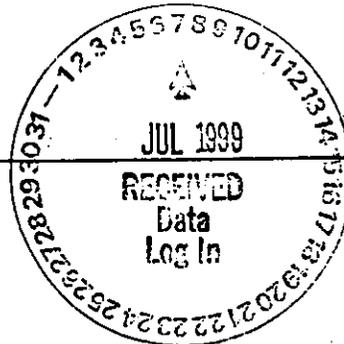




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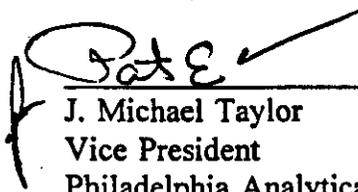
**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-002
RFW# : 9906L224
SDG# : H0437
SAF# : B99-002

W.O. # : 10985-001-001-9999-00
Date Received: 06-15-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 6 soil samples.
2. The samples were prepared and analyzed in accordance with the methods checked on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The cooler temperature was recorded on the chain-of-custody.
5. The method blank For Chromium VI was within method criteria.
6. The Laboratory Control Samples (LCS) for Chromium VI were within the laboratory control limits.
7. The matrix spike recoveries for Chromium VI were within the 75-125% control limits.
8. The replicate analyses were within the 20% Relative Percent Difference (RPD) control limit.
9. Results for solid samples are reported on a dry weight basis.



 J. Michael Taylor
 Vice President
 Philadelphia Analytical Laboratory

6-29-99
 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 12 pages.

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Collector Fahlberg/Kerkow	Company Contact R Coffman	Telephone No. 373-6425	Project Coordinator TRENT, SJ	Price Code	Date Turnaround 15 Days
Project Designation 100 BC Areas - Full Protocol	Sampling Location 100 B/C 116-B-10 Shallow	SAF No. B99-002			
Ice Chest No. SML-559	Field Logbook No. EL 1327-3	Method of Shipment Federal Express			
Shipped To DWA/RECRA R.E. 6-10-99	Offsite Property No. A990162	Bill of Lading/Air Bill No. 423579526850			
COA R16B10 2F00					

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	Cool 4C	None	None				
	Type of Container	P	aG	aG	aG	aG				
	No. of Container(s)	1	1	1	1	1				
	Special Handling and/or Storage	Volume	20mL	60mL	125mL	250mL	1000mL			

SAMPLE ANALYSIS	Activity Scan	See Item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 8010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See Item (2) in Special Instructions.					
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Sample No.	Matrix *	Sample Date	Sample Time							
BOVFK4	Soil	6-10-99	0905			X	X			
BOVFK5	Soil	6-10-99	0925			X	X			

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix * Soil Water Vapor Other Solid Other Liquid
	Relinquished By R. Fahlberg Date/Time 6-10-99 1430	Received By R. F. I-C Date/Time 6-10-99 1430	(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 - Total Sr; Nickel-63				
	Relinquished By R. Fahlberg Date/Time 6-14-99 1000	Received By R. Nielson Date/Time 6-14-99 1000	(2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)				
	Relinquished By R. Nielson Date/Time 6-14-99 1330	Received By Fed Ex Date/Time	R. Fahlberg unavailable to relinquish samples.				
Relinquished By Jedee Date/Time	Received By Goder Date/Time 6/15/99 0930						

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

1207

Collector Fahlber/Kerkow	Company Contact R Coffman	Telephone No. 373-6425	Project Coordinator TRENT, SJ	Price Code	Date Turn 15 Days
Project Designation 100 BC Areas - Full Protocol	Sampling Location 100 B/C 116-B-10 Shallow	SAF No. B99-002			
Ice Chest No. SML-559	Field Logbook No. EL 1327-3	Method of Shipment Federal Express			
Shipped To TMD/RECRA RF 6-10-99	Offsite Property No. A990162	Bill of Lading/Air Bill No. 423579526850-S.			

COA R16 B10 2F00

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	Cool 4C	None	None				
	Type of Container	P	aG	aG	aG	aG				
	No. of Container(s)	1	1	1	1	1				
	Special Handling and/or Storage	Volume	20mL	60mL	125mL	250mL	1000mL			

SAMPLE ANALYSIS				Activity Scan	See Item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See Item (2) in Special Instructions.				
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Sample No.	Matrix *	Sample Date	Sample Time									
BOVFK0	Soil	6-10-99	0820			X	X					
BOVFK1	Soil	6-10-99	0820			X	X					
BOVFK2	Soil	6-10-99	0740			X	X					
BOVFK3	Soil	6-10-99	0850			X	X					

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By RF Date/Time 1430	Received By R. Fahlber Date/Time 6-10-99	(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 - Total Sr; Nickel-63 (2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238) R. Fahlber unavailable to relinquish samples.	Soil Water Vapor Other Solid Other Liquid
Relinquished By RF #1C Date/Time 6-14-99 1000	Received By R. Nielson Date/Time 6-14-99		
Relinquished By R. Nielson Date/Time 6-14-99 1330	Received By Fahlber		
Relinquished By Jedee Date/Time	Received By Gailer Date/Time 6/15/99 0930		

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

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Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 114-13-Sub 10					
VALIDATOR: TLI		LAB: RECRUT LN		DATE: 8/6/99	
CASE:			SDG: H0437		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP/CP	<input type="checkbox"/> CLP/GFAA	<input type="checkbox"/> CLP/Mg	<input type="checkbox"/> CLP/Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> SW-846/CP	<input checked="" type="checkbox"/> SW-846/GFAA	<input type="checkbox"/> SW-846/Mg	<input type="checkbox"/> SW-846 Cyanide	<input checked="" type="checkbox"/> RECRUT	<input type="checkbox"/>
SAMPLES/MATRIX	BOVFK0	BOVFK1	BOVFK2	BOVFK3	BOVFK5
	BOVFK5				
					Seal

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? Yes No N/A

Is a case narrative present? Yes No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? Yes No N/A

Comments: _____

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? Yes No N/A

Are initial calibrations acceptable? Yes No N/A

Are ICP interference checks acceptable? Yes No N/A

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

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

Comments: _____

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A

Are ICB and CCB results acceptable? Yes No N/A

Were preparation blanks analyzed? Yes No N/A

Are preparation blank results acceptable? Yes No N/A

Were field/trip blanks analyzed? Yes No N/A

Are field/trip blank results acceptable? Yes No N/A

Comments: CROT + level over TOL had U

K2-EB all U CROT + level over TOL

5. ACCURACY

Were spike samples analyzed? Yes No N/A

Are spike sample recoveries acceptable? Yes No N/A

Were laboratory control samples (LCS) analyzed? Yes No N/A

Are LCS recoveries acceptable? Yes No N/A

Comments: level - 26.7% recovery level UR non detect
mercury No on EB ←

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INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

- Were laboratory duplicates analyzed? Yes No N/A
- Are laboratory duplicate samples RPD values acceptable? Yes No N/A
- Were ICP serial dilution samples analyzed? Yes No N/A
- Are ICP serial dilution %D values acceptable? Yes No N/A
- Are field duplicate RPD values acceptable? Yes No N/A
- Are field split RPD values acceptable? Yes No N/A

Comments: Mercury 48.2 - 3 all
Lead 33.3 - ok <5% CRDL w/in +/- 2x TDL
K0 + K1 dup mercury 35.790 -

7. FURNACE AA QUALITY CONTROL

- Were duplicate injections performed as required? Yes No N/A
- Are duplicate injection %RSD values acceptable? Yes No N/A
- Were analytical spikes performed as required? Yes No N/A
- Are analytical spike recoveries acceptable? Yes No N/A
- Was MSA performed as required? Yes No N/A
- Are MSA results acceptable? Yes No N/A

Comments: _____

8. REPORTED RESULTS AND DETECTION LIMITS

- Are results reported for all requested analyses? Yes No N/A
- Are all results supported in the raw data? Yes No N/A
- Are results calculated properly? Yes No N/A
- Do results meet the CRDLs? Yes No N/A

Comments: CR VI all on
Lead K2 on

Recre LabNet - Lionville

INORGANICS PRECISION REPORT 06/28/99

CLIENT: TMU-BANFORD 899-002

RECRA LOT #: 9906L224

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	B0VFK0	Chromium, Total	9.8	10.6	7.8	1.0
		Mercury, Total	0.33	0.20	48.2	1.0
		Lead, Total	7.5	10.5	33.3	1.0

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Recre LabNet - Lionville

INORGANICS ACCURACY REPORT 06/28/99

CLIENT: TNU-MANFORD B99-002

RECRA LOT #: 9906L224

WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED	INITIAL	SPIKED	%RECOV	DILUTION
			SAMPLE	RESULT	AMOUNT		FACTOR (SPK)
-001	BOVFK0	Chromium, Total	27.0	9.8	17.9	96.1	1.0
		Mercury, Total	0.37	0.33	0.15	26.7	1.0
		Lead, Total	50.3	7.5	44.8	95.5	1.0

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Recre LabNet - Licoville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/28/99

CLIENT: TNW-RANFORD B99-002
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9906L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0416-MB1	Chromium, Total	0.35 u	MG/KG	0.35	1.0
		Lead, Total	4.1 u	MG/KG	4.1	1.0
BLANK1	99C0178-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

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Recre LabNet - Lionville

INORGANICS PRECISION REPORT 06/22/99

CLIENT: TNU-HANFORD B99-002
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9906L224

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE RPD		
-----	-----	-----	-----	-----	-----	
-001REP	BOVFKO	% Solids	97.8	97.0	0.85	1.0
-006REP	BOVFKS	Chromium VI	0.41u	0.41u	NC	1.0

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Recre LabNet - Lionville

INORGANICS ACCURACY REPORT 06/22/99

CLIENT: TNU-HANFORD 899-002
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9906L224

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-006	80VFKS	Soluble Chromium VI	4.8	0.41u	4.1	108.6	1.0
		Insoluble Chromium VI	1060	0.41u	1200	88.1	100
BLANK10	99LV1048-MB1	Soluble Chromium VI	4.1	0.40u	4.0	103.4	1.0
		Insoluble Chromium VI	1040	0.40u	1160	89.5	100

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 6-29-99
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Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 06/22/99

CLIENT: TNU-HANFORD B99-002
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9906L224

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LV1048-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

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006⁰⁵ 11

Date: 17 August 1999
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Areas - Full Protocol - Waste Site 116-B-10
Subject: Radiochemistry - Data Package No. H0437-TNU (SDG No. H0437)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0437-TNU which was prepared by Thermo NUtech (TNU). A list of samples validated along with the analyses reported and the requested analytes is provided in the following table.

Sample ID	Sample Date	Media	Validation	Analysis
BOVFK0	06/10/99	Soil	C	See note 1
BOVFK1	06/10/99	Soil	C	See note 1
BOVFK2	06/10/99	Soil	C	See note 1
BOVFK3	06/10/99	Soil	C	See note 1
BOVFK4	06/10/99	Soil	C	See note 1
BOVFK5	06/10/99	Soil	C	See note 1

1 - Gamma spectroscopy; alpha spectroscopy (isotopic uranium, isotopic plutonium and americium-241); total strontium; nickel-63.

Data validation was conducted in accordance with the BHI validation statement of work and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL May 1998). 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

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DATA QUALITY OBJECTIVES

- **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 with liquid scintillation requiring analysis within 7 days of distillation.

Due to the analysis being conducted 8 days after the other samples in the SDG, all isotopic uranium results in sample BOVFKO were qualified as estimates and flagged "J".

All holding times were acceptable.

- **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 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 although the detection limit for uranium-233/234 (aspec), uranium-235 (aspec), uranium-238 (aspec) and uranium-238 (GEA) exceeded the target detection limit (TDL).

Equipment Blank

One equipment blank (BOVFK2) was submitted for analysis. Uranium-233/234 (aspec), uranium-238 (GEA), potassium-40, radium-226, radium-228, thorium-228 and thorium-232 were detected in the equipment blank. Under the BHI statement of work, no qualification is required.

- **Accuracy**

Accuracy is evaluated by analyzing distilled water or field samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample and matrix spike recovery range is either 70-130% or

000002

± 3 sigma. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the LCS being analyzed 6 days after the SDG, isotopic uranium results in all samples except BOVFK2 were qualified as estimates and flagged "J".

A radiochemical yield of 7% was reported for the isotopic uranium LCS and while the LCS percent recoveries for were within QC limits, isotopic uranium results in sample BOVFK2 were qualified as estimates and flagged "J" based on the low yield.

All accuracy results were acceptable.

- **Precision**

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. Precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are greater than five times the CRDL and the RPD is less than 30 percent, the results are acceptable. If either activities are less than five times the CRDL, a control limit of less than or equal to two times the CRDL is used for soil samples and less than or equal to the CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to the CRDL for water samples and less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Due to an RPD of 50%, the uranium-238 (aspec) result in sample BOVFK2 was qualified as estimates and flagged "J".

Due to the lack of a duplicate analysis, isotopic uranium results in all samples except BOVFK2 were qualified as estimates and flagged "J".

All other duplicate results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOVFK0/BOVFK1) were submitted to TNU for analysis. The duplicate sample results were compared using the

validation guidelines for determining the RPD between a sample and its duplicate. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan target detection limits (TDLs) or the contract specified MDA if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The reported detection limit exceeded the TDL for uranium-238 (GEA) in all samples; europium-155 in samples BOVFK1, BOVFK2, and BOVFK5; and uranium-235 (aspec) in sample BOVFK3. Under the BHI statement of work, no qualification is required. All other reported laboratory MDAs were at or below the analyte-specific TDL or contract specified MDA.

- **Completeness**

Data Package No. H0437 (SDG No. H0437) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to an RPD of 50%, the uranium-235 (aspec) result in sample BOVFK2 was qualified as estimates and flagged "J". Due to the lack of a duplicate analysis, isotopic uranium results in all samples except BOVFK2 were qualified as estimates and flagged "J". Due to the LCS being analyzed 6 days after the SDG, isotopic uranium results in all samples except BOVFK2 were qualified as estimates and flagged "J". Due to the analysis being conducted 8 days after the other samples in the SDG, all isotopic uranium results in sample BOVFK0 were qualified as estimates and flagged "J". A radiochemical yield of 7% was reported for the isotopic uranium LCS and while the LCS percent recoveries for were within QC limits, isotopic uranium results in sample BOVFK2 were qualified as estimates and flagged "J" based on the low yield. Data flagged "J" indicates that the associated concentration is an estimate, but under BHI guidelines, 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 reported detection limit exceeded the TDL for uranium-238 (GEA) in all samples; europium-155 in samples BOVFK1, BOVFK4, and BOVFK5; and uranium-235 (aspec) in sample BOVFK3. 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.

DOE/RL-96-22, Rev. 1, *100 Area Remedial Action Sampling and Analysis Plan*, U.S. Department of Energy, May 1998.

Appendix 1

Glossary of Data Reporting Qualifiers

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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 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 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 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.

Appendix 2
Summary of Data Qualification

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DATA QUALIFICATION SUMMARY

SDG: H0437	REVIEWER: TLI	DATE: 8/17/99	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Uranium-238 (aspec)	J	B0VFK2	RPD
Isotopic uranium	J	B0VFK2	No duplicate analysis
Isotopic uranium	J	B0VFK0, B0VFK1, B0VFK3, B0VFK4, B0VFK5	No LCS analysis
Isotopic uranium	J	B0VFK0	Not analyzed with the SDG
Isotopic uranium	J	B0VFK2	Low LCS yield

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																					
Laboratory: TNU																					
Case		SDG: H0437																			
Sample Number	BOVFK0		BOVFK1		BOVFK2		BOVFK3		BOVFK4		BOVFK5										
Location	116-B-10		116-B-10		116-B-10		116-B-10		116-B-10		116-B-10										
Remarks	A1		Duplicate		Equip. Blank		A2		A3		A4										
Sample Date	06/10/99		06/10/99		06/10/99		06/10/99		06/10/99		06/10/99										
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Uranium-233/234	0.1	0.335	J	0.446	J	0.129	J	0.375	J	0.558	J	0.549	J								
Uranium-235	0.1	0.053	UJ	0.020	UJ	0	UJ	0.030	UJ	0.013	UJ	0.012	UJ								
Uranium-238	0.1	0.371	J	0.324	J	0.172	J	0.300	J	0.700	J	0.713	J								
Plutonium-238	0.1	0.004	U	-0.010	U	0.005	U	-0.014	U	0	U	-0.008	U								
Plutonium-239/40	0.1	0.008	U	-0.006	U	0.015	U	0.005	U	0.013	U	-0.004	U								
Nickel-63	30	-0.079	U	0.102	U	0.914	U	0.242	U	-0.490	U	-0.128	U								
Americium-241	0.1	0.004	U	0	U	-0.007	U	-0.009	U	0.004	U	-0.004	U								
Strontium (total)	1	-0.061	U	-0.071	U	0.091	U	-0.066	U	0.026	U	0.016	U								
Potassium-40		12.2		12.0		4.61		12.4		12.2		13.8									
Cobalt 60	0.05	U	U	U	U	U	U	U	U	0.080		0.020	U								
Cesium 137	0.05	0.034		0.026		U	U	U	U	U	U	U	U								
Europium 152	0.1	0.024		U	U	U	U	0.053		U	U	U	U								
Europium 154	0.1	U	U	U	U	U	U	U	U	U	U	U	U								
Europium 155	0.05	U	U	U	U	U	U	U	U	U	U	U	U								
Radium-226		0.489		0.471		0.153		0.459		0.588		0.529									
Radium-228		0.671		0.557		0.224		0.642		0.715		0.670									
Thorium-228		0.639		0.605		0.154		0.607		0.670		0.622									
Thorium-232		0.671		0.557		0.224		0.642		0.715		0.670									
Americium-241 (GEA)	0.1	U	U	U	U	U	U	U	U	U	U	U	U								
Uranium-238 (GEA)	0.1	U	U	U	U	U	U	U	U	U	U	U	U								
Uranium-235 (GEA)	0.1	U	U	U	U	U	U	U	U	U	U	U	U								

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TMA / RICHMOND
 SAMPLE DELIVERY GROUP H0437

N906077-01

BOVFK0

DATA SHEET

SDG <u>7145</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0437</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N906077-01</u>	Client sample id <u>BOVFK0</u>	
Dept sample id <u>7145-001</u>	Location/Matrix <u>100 B/C 116-B-10 Shallow SOLID</u>	
Received <u>06/15/99</u>	Collected <u>06/10/99 08:20</u>	
% solids <u>96.8</u>	Custody/SAF No <u>B99-002-102</u>	<u>B99-002</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	0.335	0.11	0.068	1.0	U J	U
Uranium 235	15117-96-1	0.053	0.043	0.082	1.0	U J	U
Uranium 238	U-238	0.371	0.13	0.068	1.0	U J	U
Plutonium 238	13981-16-3	0.004	0.017	0.040	1.0	U	PU
Plutonium 239/240	PU-239/240	0.008	0.017	0.032	1.0	U	PU
Nickel 63	13981-37-8	-0.079	1.4	2.4	30	U	NI_L
Americium 241	14596-10-2	0.004	0.032	0.064	1.0	U	AM
Total Strontium	SR-RAD	-0.061	0.16	0.21	1.0	U	SR
Potassium 40	13966-00-2	12.2	0.26	0.098			GAM
Cobalt 60	10198-40-0	U		0.012	0.050	U	GAM
Cesium 137	10045-97-3	0.034	0.013	0.014	0.10	U	GAM
Europium 152	14683-23-9	0.024	0.014	0.022	0.10	U	GAM
Europium 154	15585-10-1	U		0.036	0.10	U	GAM
Europium 155	14391-16-3	U		0.045	0.10	U	GAM
Radium 226	13982-63-3	0.489	0.023	0.020	0.10		GAM
Radium 228	15262-20-1	0.671	0.050	0.047	0.20		GAM
Thorium 228	14274-82-9	0.639	0.015	0.014			GAM
Thorium 232	TH-232	0.671	0.050	0.047			GAM
Americium 241	14596-10-2	U		0.035		U	GAM
Uranium 238	U-238	U		1.8		U	GAM
Uranium 235	15117-96-1	U		0.072		U	GAM

100BC Areas - Full Protocol

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8/17/99

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>07/11/99</u>

000012

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0437

N906077-02

BOVFK1

DATA SHEET

SDG <u>7145</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0437</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N906077-02</u>	Client sample id <u>BOVFK1</u>	
Dept sample id <u>7145-002</u>	Location/Matrix <u>100 B/C 116-B-10 Shallow SOLID</u>	
Received <u>06/15/99</u>	Collected <u>06/10/99 08:20</u>	
% solids <u>96.8</u>	Custody/SAF No <u>B99-002-102</u> <u>B99-002</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	0.446	0.13	0.062	1.0	U <i>5</i>	U
Uranium 235	15117-96-1	0.020	0.020	0.075	1.0	U <i>5</i>	U
Uranium 238	U-238	0.324	0.10	0.062	1.0	U <i>5</i>	U
Plutonium 238	13981-16-3	-0.010	0.019	0.043	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.006	0.019	0.046	1.0	U	PU
Nickel 63	13981-37-8	0.102	1.3	2.3	30	U	NI_L
Americium 241	14596-10-2	0	0.019	0.035	1.0	U	AM
Total Strontium	SR-RAD	-0.071	0.12	0.18	1.0	U	SR
Potassium 40	13966-00-2	12.0	0.46	0.22			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	0.026	0.022	0.025	0.10	U	GAM
Europium 152	14683-23-9	U		0.050	0.10	U	GAM
Europium 154	15585-10-1	U		0.068	0.10	U	GAM
Europium 155	14391-16-3	U		0.055	0.10	U	GAM
Radium 226	13982-63-3	0.471	0.036	0.036	0.10		GAM
Radium 228	15262-20-1	0.557	0.10	0.11	0.20		GAM
Thorium 228	14274-82-9	0.605	0.026	0.025			GAM
Thorium 232	TH-232	0.557	0.10	0.11			GAM
Americium 241	14596-10-2	U		0.081		U	GAM
Uranium 238	U-238	U		2.5		U	GAM
Uranium 235	15117-96-1	U		0.081		U	GAM

100BC Areas - Full Protocol

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8/17/99

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>07/11/99</u>

000013

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0437

N906077-03

BOVFK2

DATA SHEET

SDG <u>7145</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0437</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N906077-03</u>	Client sample id <u>BOVFK2</u>	
Dept sample id <u>7145-003</u>	Location/Matrix <u>100 B/C 116-B-10 Shallow SOLID</u>	
Received <u>06/15/99</u>	Collected <u>06/10/99 07:40</u>	
% solids <u>100.0</u>	Custody/SAF No <u>B99-002-102</u> <u>B99-002</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	0.129	0.086	0.095	1.0	<i>U J I</i>	U
Uranium 235	15117-96-1	0	0.021	0.079	1.0	<i>U J I</i>	U
Uranium 238	U-238	0.172	0.087	0.066	1.0	<i>U J I</i>	U
Plutonium 238	13981-16-3	0.005	0.029	0.054	1.0	U	PU
Plutonium 239/240	PU-239/240	0.015	0.029	0.054	1.0	U	PU
Nickel 63	13981-37-8	0.914	1.5	2.5	30	U	NI_L
Americium 241	14596-10-2	-0.007	0.027	0.074	1.0	U	AM
Total Strontium	SR-RAD	0.091	0.17	0.22	1.0	U	SR
Potassium 40	13966-00-2	4.61	0.27	0.14			GAM
Cobalt 60	10198-40-0	U		0.014	0.050	U	GAM
Cesium 137	10045-97-3	U		0.012	0.10	U	GAM
Europium 152	14683-23-9	U		0.029	0.10	U	GAM
Europium 154	15585-10-1	U		0.042	0.10	U	GAM
Europium 155	14391-16-3	U		0.033	0.10	U	GAM
Radium 226	13982-63-3	0.153	0.020	0.021	0.10		GAM
Radium 228	15262-20-1	0.224	0.056	0.057	0.20		GAM
Thorium 228	14274-82-9	0.154	0.015	0.015			GAM
Thorium 232	TH-232	0.224	0.056	0.057			GAM
Americium 241	14596-10-2	U		0.048		U	GAM
Uranium 238	U-238	U		1.4		U	GAM
Uranium 235	15117-96-1	U		0.048		U	GAM

100BC Areas - Full Protocol

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8/17/99

DATA SHEETS
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SUMMARY DATA SECTION
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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>07/11/99</u>

000014

TMA / RICHMOND
 SAMPLE DELIVERY GROUP H0437

N906077-04

BOVFK3

DATA SHEET

SDG <u>7145</u>	Client/Case no <u>Hanford</u>	SDG-H0437
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N906077-04</u>	Client sample id <u>BOVFK3</u>	
Dept sample id <u>7145-004</u>	Location/Matrix <u>100 B/C 116-B-10 Shallow SOLID</u>	
Received <u>06/15/99</u>	Collected <u>06/10/99 08:50</u>	
* solids <u>97.1</u>	Custody/SAF No <u>B99-002-102</u>	<u>B99-002</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	0.375	0.15	0.096	1.0	<i>JS</i>	U
Uranium 235	15117-96-1	0.030	0.030	0.12	1.0	<i>JS</i>	U
Uranium 238	U-238	0.300	0.13	0.096	1.0	<i>JS</i>	U
Plutonium 238	13981-16-3	-0.014	0.018	0.050	1.0	U	PU
Plutonium 239/240	PU-239/240	0.005	0.018	0.043	1.0	U	PU
Nickel 63	13981-37-8	0.242	1.3	2.2	30	U	NI_L
Americium 241	14596-10-2	-0.009	0.018	0.050	1.0	U	AM
Total Strontium	SR-RAD	-0.066	0.16	0.20	1.0	U	SR
Potassium 40	13966-00-2	12.4	0.29	0.13			GAM
Cobalt 60	10198-40-0	U		0.014	0.050	U	GAM
Cesium 137	10045-97-3	U		0.013	0.10	U	GAM
Europium 152	14683-23-9	0.053	0.016	0.025	0.10	<i>JS</i>	GAM
Europium 154	15585-10-1	U		0.041	0.10	U	GAM
Europium 155	14391-16-3	U		0.037	0.10	U	GAM
Radium 226	13982-63-3	0.459	0.027	0.025	0.10		GAM
Radium 228	15262-20-1	0.642	0.066	0.061	0.20		GAM
Thorium 228	14274-82-9	0.607	0.017	0.016			GAM
Thorium 232	TH-232	0.642	0.066	0.061			GAM
Americium 241	14596-10-2	U		0.040		U	GAM
Uranium 238	U-238	U		1.6		U	GAM
Uranium 235	15117-96-1	U		0.052		U	GAM

100BC Areas - Full Protocol

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8/17/99

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>07/11/99</u>

000015

TMA / RICHMOND
 SAMPLE DELIVERY GROUP H0437

N906077-05

BOVFK4

DATA SHEET

SDG <u>7145</u>	Client/Case no <u>Hanford</u>	SDG-H0437
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N906077-05</u>	Client sample id <u>BOVFK4</u>	
Dept sample id <u>7145-005</u>	Location/Matrix <u>100 B/C 116-B-10 Shallow SOLID</u>	
Received <u>06/15/99</u>	Collected <u>06/10/99 09:05</u>	
‡ solids <u>96.1</u>	Custody/SAF No <u>B99-002-103</u> <u>B99-002</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	0.558	0.16	0.084	1.0	U S	U
Uranium 235	15117-96-1	0.013	0.053	0.10	1.0	U S	U
Uranium 238	U-238	0.700	0.19	0.084	1.0	U S	U
Plutonium 238	13981-16-3	0	0.017	0.046	1.0	U	PU
Plutonium 239/240	PU-239/240	0.013	0.017	0.032	1.0	U	PU
Nickel 63	13981-37-8	-0.490	1.2	2.0	30	U	NI_L
Americium 241	14596-10-2	0.004	0.026	0.048	1.0	U	AM
Total Strontium	SR-RAD	0.026	0.11	0.15	1.0	U	SR
Potassium 40	13966-00-2	12.2	0.53	0.27			GAM
Cobalt 60	10198-40-0	0.080	0.039	0.037	0.050		GAM
Cesium 137	10045-97-3	U		0.024	0.10	U	GAM
Europium 152	14683-23-9	U		0.062	0.10	U	GAM
Europium 154	15585-10-1	U		0.094	0.10	U	GAM
Europium 155	14391-16-3	U		0.099	0.10	U	GAM
Radium 226	13982-63-3	0.588	0.055	0.050	0.10		GAM
Radium 228	15262-20-1	0.715	0.12	0.12	0.20		GAM
Thorium 228	14274-82-9	0.670	0.030	0.028			GAM
Thorium 232	TH-232	0.715	0.12	0.12			GAM
Americium 241	14596-10-2	U		0.038		U	GAM
Uranium 238	U-238	U		3.5		U	GAM
Uranium 235	15117-96-1	U		0.082		U	GAM

100BC Areas - Full Protocol

rw
8/17/99

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>07/11/99</u>

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0437

N906077-06

BOVFK5

DATA SHEET

SDG <u>7145</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0437</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N906077-06</u>	Client sample id <u>BOVFK5</u>	
Dept sample id <u>7145-006</u>	Location/Matrix <u>100 B/C 116-B-10 Shallow SOLID</u>	
Received <u>06/15/99</u>	Collected <u>06/10/99 09:25</u>	
* solids <u>96.4</u>	Custody/SAF No <u>B99-002-103</u>	<u>B99-002</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	0.549	0.16	0.074	1.0	<i>JS</i>	U
Uranium 235	15117-96-1	0.012	0.023	0.089	1.0	U <i>JS</i>	U
Uranium 238	U-238	0.713	0.18	0.074	1.0	<i>JS</i>	U
Plutonium 238	13981-16-3	-0.008	0.015	0.046	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.004	0.015	0.036	1.0	U	PU
Nickel 63	13981-37-8	-0.128	1.3	2.3	30	U	NI_L
Americium 241	14596-10-2	-0.004	0.027	0.060	1.0	U	AM
Total Strontium	SR-RAD	0.016	0.10	0.14	1.0	U	SR
Potassium 40	13966-00-2	13.8	0.52	0.26			GAM
Cobalt 60	10198-40-0	0.020	0.020	0.026	0.050	U	GAM
Cesium 137	10045-97-3	U		0.022	0.10	U	GAM
Europium 152	14683-23-9	U		0.054	0.10	U	GAM
Europium 154	15585-10-1	U		0.076	0.10	U	GAM
Europium 155	14391-16-3	U		0.061	0.10	U	GAM
Radium 226	13982-63-3	0.529	0.036	0.033	0.10		GAM
Radium 228	15262-20-1	0.670	0.11	0.12	0.20		GAM
Thorium 228	14274-82-9	0.622	0.028	0.028			GAM
Thorium 232	TH-232	0.670	0.11	0.12			GAM
Americium 241	14596-10-2	U		0.090		U	GAM
Uranium 238	U-238	U		2.7		U	GAM
Uranium 235	15117-96-1	U		0.089		U	GAM

100BC Areas - Full Protocol

JS
8/17/99

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>07/11/99</u>

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

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Case Narrative

1.0 GENERAL

Bechtel Hanford Inc. Sample Delivery Group H0437 is composed of six solid (soil) samples designated under SAF No. B99-002 with a Project Designation of: 100 BC Areas – Full Protocol.

The samples were received as stated on the Chain-of-Custody documents. Any discrepancies are noted on the TNU Sample Receipt Checklist.

2.0 ANALYSIS NOTES

2.1 Americium-241 Analyses

No problems were encountered during the course of the analyses.

2.2 Gamma Scan 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 Uranium Analyses

The yield observed for the LCS was very low, however the recoveries of the added isotopes were within the acceptable range. No other problems were encountered during the course of the analyses.

2.5 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.6 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-002-103

Page 1 of 1

Collector Fahiber/Kerkow	Company Contact R Coffman	Telephone No. 373-6425	Project Coordinator TRENT, SJ	Price Code	Data Turnaround 15 Days
Project Designation 100 BC Areas - Full Protocol	Sampling Location 100 B/C 116-B-10 Shallow	SAF No. B99-002			
Ice Chest No. EHC96-013	Field Logbook No. EL 1327-3	Method of Shipment Federal Express			
Shipped To TMA/REGRA RF 6-10-99	Offsite Property No. APP0161	Bill of Lading/Air Bill No. 423579526849			
COA R16 B10 2FOO					

POSSIBLE SAMPLE HAZARDS/REMARKS

Preservation	None	None	Cool 4C	None	None	
Type of Container	P	aG	aG	aG	aG	
No. of Container(s)	1	1	1	1	1	
Special Handling and/or Storage	Volume	20mL	60mL	125mL	250mL	1000mL

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	See item (1) in Special Instructions.	Chromium Hex - 7196	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions.
BOVFK4	Soil	6-10-99	0905	X	X			X
BOVFK5	Soil	6-10-99	0925	X	X			X

CHAIN OF POSSESSION

Sign/Print Names

Relinquished By R. Fahiber	Date/Time 6-10-99 1430	Received By R. Fahiber	Date/Time 6-10-99 1430
Relinquished By Ref # IC	Date/Time 6-14-99 1000	Received By R. Nielson	Date/Time 6-14-99 1000
Relinquished By R. Nielson	Date/Time 6-14-99 1330	Received By Fettuf	Date/Time 6/14/99
Relinquished By FedEx	Date/Time 6/15/99 9:50	Received By TNU M. Goldenberg	Date/Time 6/15/99 9:50

SPECIAL INSTRUCTIONS

- (1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 - Total Sr; Nickel-63
- (2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

R. Fahiber unavailable to relinquish samples.

Matrix *

- Soil
- Water
- Vapor
- Other Solid
- Other Liquid

LABORATORY SECTION

Received By	Date/Time
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FINAL SAMPLE DISPOSITION

Disposal Method	Disposed By	Date/Time
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Collector Fahlber/Kerkow	Company Contact R Coffman	Telephone No. 373-6425	Project Coordinator TRENT, SJ	Price Code	Data Turnaround 15 Days
Project Designation 100 BC Area - Full Protocol	Sampling Location 100 B/C 116-B-10 Shallow	SAF No. B99-002			
Ice Chest No. ERC96-013	Field Logbook No. EL 1327-3	Method of Shipment Federal Express			
Shipped To TMA/REGRA R.F. 6.10.99	Offsite Property No. A99D161	Bill of Lading/Air Bill No. 923579524849			
COA R16B10 2F00					

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	Cool 4C	None	None
		Type of Container	P	aG	aG	aG
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1
	Volume	20mL	60mL	125mL	250mL	1000mL

SAMPLE ANALYSIS				Activity Scan	See item (1) in Special Instructions	Chromium Hex - 7196	KP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See item (2) in Special Instructions
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Sample No.	Matrix *	Sample Date	Sample Time							
BOVFK0	Soil	6.10.99	0820	X	X			X		
BOVFK1	Soil	6.10.99	0820	X	X			X		
BOVFK2	Soil	6.10.99	0740	X	X			X		
BOVFK3	Soil	6.10.99	0850	X	X			X		

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix * Soil Water Vapor Other Solid Other Liquid
	Relinquished By R. Fahlber Date/Time 6/10/99	Received By R.F. I.C. Date/Time 6.10.99	(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr; Nickel-63 (2) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238) R Fahlberg unavailable to relinquish samples.				
	Relinquished By R. Fahlber Date/Time 6/14/99	Received By R. Nielson Date/Time 6/14/99					
	Relinquished By R. Nielson Date/Time 6/14/99	Received By FedEx Date/Time 6/14/99					
Relinquished By FedEx Date/Time 6/15/99	Received By TNU M. Goldensberg Date/Time 6/15/99						
LABORATORY SECTION	Received By	Disposed By				Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method					Date/Time	

Appendix 5

Data Validation Supporting Documentation

000022

3. Continuing Calibration N/A

Calibration checked within one week of sample analysis? . . . Yes No N/A

Calibration check acceptable? Yes No N/A

Calibration check standards NIST traceable? Yes No N/A

Calibration check standards expired? Yes No N/A

Comments: _____

4. Blanks N/A

Method blank analyzed? 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? Yes No N/A

Comments: all type uranium over TDL U 238

FB DOU FK2 U-233/34, U238 (yes) K-40 & Radium + thorium

5. Matrix Spikes N/A

Matrix spike analyzed? Yes No N/A

Spike recoveries acceptable? Yes No N/A

Spike source traceable? Yes No N/A

Spike source expired? Yes No N/A

Transcription/Calculation Errors? Yes No N/A

Comments: Ni-63 uses field

- 6. Laboratory Control Samples N/A
- LCS analyzed? Yes No N/A
- LCS recoveries acceptable? Yes No N/A
- LCS traceable? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: _____

- 7. Chemical Recovery N/A
- Chemical carrier added? Yes No N/A
- Chemical recovery acceptable? Yes No N/A
- Chemical carrier traceable? Yes No N/A
- Chemical carrier expired? Yes No N/A
- Transcription/Calculation errors? Yes No N/A

Comments: _____

- 8. Duplicates N/A
- Duplicates Analyzed? Yes No N/A
- RPD Values Acceptable? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: V-233/234 (4370) + U-235 (5020) J
→ ok w/in 2x Tol

9. Field QC Samples 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: LC + KI

10. Holding Times

Are sample holding times acceptable? Yes No N/A

Comments: FK0 + FK2 not analyzed w/ CDC
has QC (2 of 3)

11. Results and Detection Limits (Levels D & E) N/A

- Results reported for all required sample analyses? Yes No N/A
- Results supported in raw data? Yes No N/A
- Results Acceptable? Yes No N/A
- Transcription/Calculation errors? Yes No N/A
- MDA's meet required detection limits? Yes No N/A
- Transcription/calculation errors? Yes No N/A

Comments: U 238 all EU-155 KI, LC4, KS
U 235 (Aspen) FK3

Agk

TMA / RICHMOND
 SAMPLE DELIVERY GROUP H0437

N906077-08

Method Blank

METHOD BLANK

SDG <u>7145</u>	Client/Case no <u>Hanford</u>	SDG-H0437
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N906077-08</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7145-008</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-002</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	0.030	0.12	1.0	U	U
Uranium 235	15117-96-1	0.037	0.037	0.14	1.0	U	U
Uranium 238	U-238	0	0.030	0.12	1.0	U	U
Plutonium 238	13981-16-3	-0.008	0.030	0.083	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.008	0.045	0.092	1.0	U	PU
Nickel 63	13981-37-8	-0.268	1.2	2.0	30	U	NI_L
Americium 241	14596-10-2	0.009	0.027	0.043	1.0	U	AM
Total Strontium	SR-RAD	-0.095	0.14	0.19	1.0	U	SR
Potassium 40	13966-00-2	U		0.093		U	GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Cesium 137	10045-97-3	U		0.009	0.10	U	GAM
Europium 152	14683-23-9	U		0.020	0.10	U	GAM
Europium 154	15585-10-1	U		0.026	0.10	U	GAM
Europium 155	14391-16-3	U		0.011	0.10	U	GAM
Radium 226	13982-63-3	U		0.014	0.10	U	GAM
Radium 228	15262-20-1	U		0.034	0.20	U	GAM
Thorium 228	14274-82-9	U		0.010		U	GAM
Thorium 232	TH-232	U		0.034		U	GAM
Americium 241	14596-10-2	U		0.008		U	GAM
Uranium 238	U-238	U		1.1		U	GAM
Uranium 235	15117-96-1	U		0.022		U	GAM

100BC Areas - Full Protocol

QC-BLANK 31110

METHOD BLANKS

Page 1

SUMMARY DATA SECTION

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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>07/11/99</u>

000027

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0437

N906077-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7145</u> Contact <u>L.A. Johnson</u> Lab sample id <u>N906077-07</u> Dept sample id <u>7145-007</u>	Client/Case no <u>Hanford</u> <u>SDG-H0437</u> Case no <u>TRB-SBB-207925</u> Client sample id <u>Lab Control Sample</u> Material/Matrix _____ <u>SOLID</u> SAF No <u>B99-002</u>
---	--

ANALYTE	RESULT	2σ ERR	MOA	RDL	QUALI-	ADDED	2σ ERR	REC	3σ	LMTS	PROTOCOL
	pCi/g	(COUNT)	pCi/g	pCi/g	FIERS TEST	pCi/g	pCi/g	%	(TOTAL)	LIMITS	LIMITS
Uranium 233/234	5.06	2.2	<u>1.4</u>	1.0	U	4.64	0.19	109	28-172	80-120	
Uranium 235	3.46	1.7	1.0	1.0	U	3.77	0.15	92	32-168	80-120	
Uranium 238	4.84	2.2	<u>1.2</u>	1.0	U	5.03	0.20	96	34-166	80-120	
Plutonium 238	10.3	0.81	0.033	1.0	PU	10.0	0.40	103	84-116	80-120	
Plutonium 239/240	10.2	0.81	0.033	1.0	PU	10.6	0.42	96	85-115	80-120	
Nickel 63	135	3.7	2.0	30	NI_L	134	5.4	101	83-117		
Americium 241	19.8	1.4	0.044	1.0	AM	19.2	0.77	103	85-115	80-120	
Total Strontium	12.6	0.83	0.58	1.0	SR	11.4	0.46	110	79-121		
Cobalt 60	0.189	0.013	0.007	0.050	GAM	0.196	0.008	96	75-125	80-120	
Cesium 137	0.220	0.011	0.007	0.10	GAM	0.227	0.009	97	76-124	80-120	

100BC Areas - Full Protocol

QC-LCS 31109

LAB CONTROL SAMPLES

Page 1

SUMMARY DATA SECTION

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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>07/11/99</u>

000028

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0437

N906077-09

BOVFK0

DUPLICATE

SDG <u>7145</u>	Client/Case no <u>Hanford</u>	SDG-H0437
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N906077-09</u>	Lab sample id <u>N906077-01</u>	Client sample id <u>BOVFK0</u>
Dept sample id <u>7145-009</u>	Dept sample id <u>7145-001</u>	Location/Matrix <u>100 B/C 116-B-10 Shallow SOLID</u>
	Received <u>06/15/99</u>	Collected <u>06/10/99 08:20</u>
% solids <u>96.8</u>	% solids <u>96.8</u>	Custody/SAF No <u>B99-002-102</u> <u>B99-002</u>

ANALYTE	DUPLICATE		2σ ERR		MDA		RDL		QUALI-		ORIGINAL		2σ ERR		MDA		QUALI-		RPD		3σ PROT	
	pCi/g	(COUNT)	pCi/g	pCi/g	pCi/g	pCi/g	FIERS	TEST	pCi/g	(COUNT)	pCi/g	FIERS	%	TOT	LIMIT							
Barium 233/234	0.521	0.18	0.093	1.0	J	U	0.335	0.11	0.068	J	43	75										
Barium 235	0.015	0.029	0.11	1.0	U	U	0.053	0.043	0.082	U	-	-										
Barium 238	0.618	0.18	0.093	1.0	J	U	0.371	0.13	0.068	J	50	68										
Bismuth 238	-0.014	0.018	0.051	1.0	U	FU	0.004	0.017	0.040	U	-	-										
Bismuth 239/240	0.014	0.018	0.035	1.0	U	FU	0.008	0.017	0.032	U	-	-										
Cadmium 63	-0.251	1.2	2.0	30	U	NI_L	-0.079	1.4	2.4	U	-	-										
Cesium 241	0.009	0.027	0.049	1.0	U	AM	0.004	0.032	0.064	U	-	-										
Strontium 90	-0.035	0.069	0.098	1.0	U	SR	-0.061	0.16	0.21	U	-	-										
Caesium 137	11.6	0.41	0.20			GAM	12.2	0.26	0.098		5	32										
Thallium 208	U		0.021	0.050	U	GAM	U		0.012	U	-	-										
Caesium 137	U		0.026	0.10	U	GAM	0.034	0.013	0.014	J	27	149										
Iodine 131	U		0.044	0.10	U	GAM	0.024	0.014	0.022	J	59	206										
Iodine 154	U		0.063	0.10	U	GAM	U		0.036	U	-	-										
Iodine 155	U		0.12	0.10	U	GAM	U		0.045	U	-	-										
Strontium 90	0.527	0.037	0.036	0.10		GAM	0.489	0.023	0.020		7	34										
Strontium 90	0.704	0.090	0.092	0.20		GAM	0.671	0.050	0.047		5	39										
Strontium 90	0.631	0.024	0.022			GAM	0.639	0.015	0.014		1	32										
Strontium 90	0.704	0.090	0.092			GAM	0.671	0.050	0.047		5	39										
Cesium 241	U		0.061		U	GAM	U		0.035	U	-	-										
Barium 238	U		2.2		U	GAM	U		1.8	U	-	-										
Barium 235	U		0.072		U	GAM	U		0.072	U	-	-										

DOBC Areas - Full Protocol

DUP#1 31111

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 07/11/99

000029

Comments – RL Weiss

SDG H0399 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VD41, B0VD43, B0VD44 failed. Correct summary table and narrative.
- Minor Deficiencies - Remove 1st paragraph (does not reflect earlier statement in PRECISION and no "J" were applied to the data.

SDG H0434 Inorganic – No comments

SDG H0434 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VF69, B0VF70, B0VF71, B0V72, failed. Correct summary table and narrative.
- Need to apply "J" flag to Am-241 results on pg. 14 (B0VF72).

SDG H0387 Inorganic – No comments

SDG H0387 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample number B0V6N8 failed. Correct summary table and narrative.

SDG H0377 Inorganic – No comments.

SDG H0377 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample number B0V1X0 failed. Correct summary table and narrative.

SDG H0437 Inorganic

- ACCURACY – MS failure was for Hg not Pb. Correct narrative, tables, and annotated results.

SDG H0437 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VFK2, B0VFK4, B0VFK5 failed. Correct summary table and narrative.
- The package has 2 narrative sections. The one with the "wrong" waste site (116-B6A) appears to be more correct except for waste site identity.

SDG H0393 Inorganic – No comments.

SDG H0393 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VD36, B0VD39, B0VB3 failed. Correct summary table and narrative.

SDG H0436 Inorganic – No comments.

SDG H0436 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VLC4, B0VLC6 failed. Correct summary table and narrative.

SDG H0409 Inorganic – No comments.

SDG H0409 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VFL1, B0VFL2, B0VFL3, B0VFL4, B0VFL6, B0VFM3, B0VFM6 failed. Correct summary table and narrative.

Review Comment Record (RCR)	1. Date 8/24/99	2. Review No. BHI/QA99017
	3. Project Waste Site 116-B-10	4. Page Page 1 of 1

5. Document Number(s)/Title(s) H0437-TNU&RLN (SDG No. H0437)	6. Program/Project/ Building Number 100-BC Areas - Full Protocol - Waste Site 116-B-10	7. Reviewer Claude Stacey	8. Organization/Group BHI/QA	9. Location/Phone H0-16/372-9208
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17. Comment Submittal Approval: _____ Organization Manager (Optional)	10. Agreement with indicated comment disposition(s) _____ Date	11. CLOSED 8/31/99 Date	 _____ Reviewer/Point of Contact
	_____ Author/Originator		_____ Author/Originator

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
1	Inorganic: Page 2, Holding Times, first line has "... 30 days for chrome VI; ..." The "chrome" should be "chromium".		corrected 8/25/99	
2	Radiochemistry: Page 11, the CRDL for Eu-155, and Cs-137 should be 0.05 not 0.1; consequently, samples BOVFK1, BOVFK4, and BOVFK5 MDAs were greater than the CRDL for Eu-155.		corrected 8/25/99	
3	Radiochemistry: Page 2, 1 st paragraph under Blanks states "... sample results below the MDA are elevated to the MDA and qualified as undetected ..." This is not what's being done and the sentence needs to be changed to "... sample results below the MDA are qualified as undetected ..."		corrected 8/25/99	

Comments – RL Weiss

SDG H0399 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VD41, B0VD43, B0VD44 failed. Correct summary table and narrative.
- Minor Deficiencies - Remove 1st paragraph (does not reflect earlier statement in PRECISION and no "J" were applied to the data.

SDG H0434 Inorganic – No comments

SDG H0434 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VF69, B0VF70, B0VF71, B0V72, failed. Correct summary table and narrative.
- Need to apply "J" flag to Am-241 results on pg. 14 (B0VF72).

SDG H0387 Inorganic – No comments

SDG H0387 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample number B0V6N8 failed. Correct summary table and narrative.

SDG H0377 Inorganic – No comments.

SDG H0377 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample number B0V1X0 failed. Correct summary table and narrative.

SDG H0437 Inorganic

- ACCURACY – MS failure was for Hg not Pb. Correct narrative, tables, and annotated results. *corrected 8/25/99*

SDG H0437 Rad

- 100-BC TDL for Eu-155 is 0.05 pCi/g. Sample numbers B0VFK2, B0VFK4, B0VFK5 failed. Correct summary table and narrative. *FK7*
- The package has 2 narrative sections. The one with the "wrong" waste site (116-B6A) appears to be more correct except for waste site identity. *correct 8/25/99*

Duncan, Jeanette M

From: Routt, Tina/RLO [troutt@CH2M.com]
Sent: Thursday, August 19, 1999 12:15 PM
To: Duncan, Jeanette/RLO-HAN
Subject: Review of Validation Report for H0437 (B-10)

Jeanette -

I have finished reviewing the validation report for H0437 (site B-10). I only have one comment/request. The validator has crossed out data qualifiers for certain analytes on a couple of samples without explaining why. Please have him include an explanation for this. No other changes.

*per BHI's request lab qualifiers are lined out.
per 8/25/99*

Tina Routt
CH2M Hill Richland Office
(509) 375-3444, ext. 211
(509) 375-5566 fax

<h1>Review Comment Record (RCR)</h1>	1. Date 8/24/99	2. Review No. BHI/QA99017
	3. Project Waste Site 116-B-10	4. Page Page 1 of 1

5. Document Number(s)/Title(s) H0437-TNU&RLN (SDG No. H0437)	6. Program/Project/ Building Number 100-BC Areas – Full Protocol – Waste Site 116-B-10	7. Reviewer Claude Stacey	8. Organization/Group BHI/QA	9. Location/Phone H0-16/372-9208
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17. Comment Submittal Approval: _____ 10. Agreement with indicated comment disposition(s) _____ 11. CLOSED

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

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