

Date: 20 July 1999
 To: Bechtel Hanford, Inc. (technical representative)
 From: TechLaw, Inc.
 Project: 100-BC Areas - Full Protocol - Waste Site 116-B-3
 Subject: Radiochemistry - Data Package No. H0399-TNU (DPG No. H0399)

RECEIVED
 APR 25 2000

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0399-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
BOVD41	05/04/99	Soil	C	See note 1
BOVD42	05/04/99	Soil	C	See note 1
BOVD43	05/04/99	Soil	C	See note 1
BOVD44	05/04/99	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

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.

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 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 reported detection limit for uranium-238 (GEA) exceeded the target detection limit (TDL).

- **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 70-130% or ± 3 sigma. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. 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.

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

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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.

The laboratory duplicate for gamma spectroscopy was analyzed one day later than the last sample in the SDG, however the RPDs were all within QC limits and no qualifiers were assigned.

All duplicate results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOVD42/BOVD43) 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 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 in the following: Uranium-238 (GEA) in all samples; and europium-152, americium-241 (GEA) and uranium-235 (GEA) in sample BOVD41. 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. H0399 (SDG No. H0399) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the duplicate analysis not being conducted with the SDG, all gamma spectroscopy results were qualified as estimates and flagged "J". Data flagged

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"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 reported detection limit exceeded the TDL in the following: Uranium-238 (GEA) in all samples; and europium-152, americium-241 (GEA) and uranium-235 (GEA) in sample BOVD41. 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: H0399	REVIEWER: TLI	DATE: 7/20/99	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

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Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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Project: BECHTEL-HANFORD																
Laboratory: TNU																
Case		SDG: H0399														
Sample Number	BOVD41		BOVD42		BOVD43		BOVD44									
Location	116-B-3		116-B-3		116-B-3		116-B-3									
Remarks	A1		A2		Duplicate		A3									
Sample Date	05/04/99		05/04/99		05/04/99		05/04/99									
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Uranium-234	0.1	0.458		0.558		0.539		0.395								
Uranium-235	0.1	0.052 U		0.043 U		0.063 U		0.038 U								
Uranium-238	0.1	0.362		0.496		0.58		0.353								
Plutonium-238	0.1	0.017 U		0.004 U		0 U		-0.008 U								
Plutonium-239/40	0.1	0.256		0.094		0.113		0.033								
Nickel-63	30	0.12 U		-0.058 U		-0.572 U		0.39 U								
Americium-241	0.1	0.019 U		0.005 U		0.013 U		0.019 U								
Strontium (total)	1	3.16		0.563		0.652		-0.012 U								
Potassium-40		11.2		11.7		12.2		9.83								
Cobalt 60	0.05	U U		U U		U U		U U								
Cesium 137	0.1	19.7		4.71		3.46		1.22								
Europium 152	0.1	U U		U U		U U		U U								
Europium 154	0.1	U U		U U		U U		U U								
Europium 155	0.1	U U		U U		U U		U U								
Radium-226		0.349		0.396		0.457		0.39								
Radium-228		0.617		0.65		0.615		0.594								
Thorium-228		0.698		0.59		0.625		0.507								
Thorium-232		0.617		0.65		0.615		0.594								
Americium-241 (GEA)	0.1	U U		U U		U U		U U								
Uranium-238 (GEA)	0.1	U U		U U		U U		U U								
Uranium-235 (GEA)	0.1	U U		U U		U U		U U								

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SAMPLE DELIVERY GROUP H0399

N905031-01

BOVD41

DATA SHEET

SDG <u>7121</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0399</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N905031-01</u>	Client sample id <u>BOVD41</u>	
Dept sample id <u>7121-001</u>	Location/Matrix <u>100 B/C 116-B-3</u>	<u>SOLID</u>
Received <u>05/07/99</u>	Collected <u>05/04/99 12:15</u>	
‡ solids <u>96.0</u>	Custody/SAF No <u>B99-002-89</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	0.458	0.16	0.082	0.30		U
Uranium 235	15117-96-1	0.052	0.052	0.099	0.30	U	U
Uranium 238	U-238	0.362	0.13	0.082	0.30		U
Plutonium 238	13981-16-3	0.017	0.025	0.046	0.050	U	PU
Plutonium 239/240	PU-239/240	0.256	0.068	0.040	0.050		PU
Nickel 63	13981-37-8	0.120	1.2	2.1	20	U	NI_L
Americium 241	14596-10-2	0.019	0.038	<u>0.064</u>	0.050	U	AM
Total Strontium	SR-RAD	3.16	0.22	0.14	1.0		SR
Potassium 40	13966-00-2	11.2	0.45	0.25			GAM
Cobalt 60	10198-40-0	U		0.021	0.050	U	GAM
Cesium 137	10045-97-3	19.7	0.13	0.048	0.050		GAM
Europium 152	14683-23-9	U		<u>0.27</u>	0.10	U	GAM
Europium 154	15585-10-1	U		0.066	0.10	U	GAM
Europium 155	14391-16-3	U		0.099	0.10	U	GAM
Radium 226	13982-63-3	0.349	0.058	0.076	0.10		GAM
Radium 228	15262-20-1	0.617	0.090	0.093	0.20		GAM
Thorium 228	14274-82-9	0.696	0.067	0.079			GAM
Thorium 232	TH-232	0.617	0.090	0.093			GAM
Americium 241	14596-10-2	U		0.14		U	GAM
Uranium 238	U-238	U		2.4		U	GAM
Uranium 235	15117-96-1	U		0.17		U	GAM

100 BC Areas-Full Protocol

Handwritten:

 6/30/99

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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>06/02/99</u>

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 SAMPLE DELIVERY GROUP H0399

N905031-02

BOVD42

DATA SHEET

SDG <u>7121</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0399</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N905031-02</u>	Client sample id <u>BOVD42</u>	
Dept sample id <u>7121-002</u>	Location/Matrix <u>100 B/C 116-B-3</u>	<u>SOLID</u>
Received <u>05/07/99</u>	Collected <u>05/04/99 12:43</u>	
% solids <u>96.7</u>	Custody/SAF No <u>B99-002-89</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	0.15	0.068	0.30		U
Uranium 235	15117-96-1	0.043	0.043	0.082	0.30	U	U
Uranium 238	U-238	0.496	0.13	0.068	0.30		U
Plutonium 238	13981-16-3	0.004	0.026	0.047	0.050	U	PU
Plutonium 239/240	PU-239/240	0.094	0.043	0.033	0.050		PU
Nickel 63	13981-37-8	-0.058	1.5	2.6	20	U	NI_L
Americium 241	14596-10-2	0.005	0.021	0.050	0.050	U	AM
Total Strontium	SR-RAD	0.563	0.12	0.14	1.0	J	SR
Potassium 40	13966-00-2	11.7	0.27	0.10			GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	4.71	0.042	0.016	0.050		GAM
Europium 152	14683-23-9	U		0.047	0.10	U	GAM
Europium 154	15585-10-1	U		0.040	0.10	U	GAM
Europium 155	14391-16-3	U		0.050	0.10	U	GAM
Radium 226	13982-63-3	0.396	0.025	0.026	0.10		GAM
Radium 228	15262-20-1	0.650	0.052	0.050	0.20		GAM
Thorium 228	14274-82-9	0.590	0.019	0.022			GAM
Thorium 232	TH-232	0.650	0.052	0.050			GAM
Americium 241	14596-10-2	U		0.047		U	GAM
Uranium 238	U-238	U		1.6		U	GAM
Uranium 235	15117-96-1	U		0.064		U	GAM

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6/30/99

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Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>06/02/99</u>

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SAMPLE DELIVERY GROUP H0399

N905031-03

B0VD43

DATA SHEET

SDG <u>7121</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0399</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N905031-03</u>	Client sample id <u>B0VD43</u>	
Dept sample id <u>7121-003</u>	Location/Matrix <u>100 B/C 116-B-3</u>	<u>SOLID</u>
Received <u>05/07/99</u>	Collected <u>05/04/99 12:43</u>	
% solids <u>96.9</u>	Custody/SAF No <u>B99-002-89</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	0.539	0.15	0.079	0.30		U
Uranium 235	15117-96-1	0.063	0.051	0.096	0.30	U	U
Uranium 238	U-238	0.580	0.17	0.079	0.30		U
Plutonium 238	13981-16-3	0	0.018	0.043	0.050	U	PU
Plutonium 239/240	PU-239/240	0.113	0.046	0.035	0.050		PU
Nickel 63	13981-37-8	-0.572	1.4	2.4	20	U	NI_L
Americium 241	14596-10-2	0.013	0.038	0.078	0.050	U	AM
Total Strontium	SR-RAD	0.652	0.12	0.13	1.0	J	SR
Potassium 40	13966-00-2	12.2	0.52	0.24			GAM
Cobalt 60	10198-40-0	U		0.027	0.050	U	GAM
Cesium 137	10045-97-3	3.46	0.066	0.033	0.050		GAM
Europium 152	14683-23-9	U		0.073	0.10	U	GAM
Europium 154	15585-10-1	U		0.091	0.10	U	GAM
Europium 155	14391-16-3	U		0.056	0.10	U	GAM
Radium 226	13982-63-3	0.457	0.052	0.050	0.10		GAM
Radium 228	15262-20-1	0.615	0.11	0.11	0.20		GAM
Thorium 228	14274-82-9	0.625	0.031	0.034			GAM
Thorium 232	TH-232	0.615	0.11	0.11			GAM
Americium 241	14596-10-2	U		0.033		U	GAM
Uranium 238	U-238	U		3.0		U	GAM
Uranium 235	15117-96-1	U		0.096		U	GAM

100 BC Areas-Full Protocol

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6/30/99

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>06/02/99</u>

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 SAMPLE DELIVERY GROUP H0399

N905031-04

BOVD44

DATA SHEET

SDG <u>7121</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0399</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N905031-04</u>	Client sample id <u>BOVD44</u>	
Dept sample id <u>7121-004</u>	Location/Matrix <u>100 B/C 116-B-3</u>	<u>SOLID</u>
Received <u>05/07/99</u>	Collected <u>05/04/99 13:10</u>	
† solids <u>97.1</u>	Custody/SAF No <u>B99-002-89</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	0.395	0.13	0.079	0.30		U
Uranium 235	15117-96-1	0.038	0.050	0.096	0.30	U	U
Uranium 238	U-238	0.353	0.13	0.079	0.30		U
Plutonium 238	13981-16-3	-0.008	0.016	0.045	0.050	U	PU
Plutonium 239/240	PU-239/240	0.033	0.025	0.031	0.050	J	PU
Nickel 63	13981-37-8	0.390	1.6	2.6	.20	U	NI_L
Americium 241	14596-10-2	0.019	0.029	0.037	0.050	U	AM
Total Strontium	SR-RAD	-0.012	0.25	0.35	1.0	U	SR
Potassium 40	13966-00-2	9.83	0.45	0.23			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	1.22	0.040	0.028	0.050		GAM
Europium 152	14683-23-9	U		0.061	0.10	U	GAM
Europium 154	15585-10-1	U		0.066	0.10	U	GAM
Europium 155	14391-16-3	U		0.058	0.10	U	GAM
Radium 226	13982-63-3	0.390	0.046	0.047	0.10		GAM
Radium 228	15262-20-1	0.594	0.096	0.098	0.20		GAM
Thorium 228	14274-82-9	0.507	0.026	0.028			GAM
Thorium 232	TH-232	0.594	0.096	0.098			GAM
Americium 241	14596-10-2	U		0.083		U	GAM
Uranium 238	U-238	U		2.5		U	GAM
Uranium 235	15117-96-1	U		0.093		U	GAM

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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 H0399 is comprised of four 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 document. Any discrepancies are noted on the TNU Sample Receipt Checklist. All results were transmitted to Bechtel Hanford via fax on June 2, 1999 with the exception of Gamma Scan and Total Uranium which were sent on May 24, 1999.

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analyses

No problems were encountered during the processing of the samples.

2.2 Total Strontium Analyses

No problems were encountered during the processing of the samples.

2.3 Isotopic Plutonium Analyses

No problems were encountered during the processing of the samples.

2.4 Gamma Scan Analyses

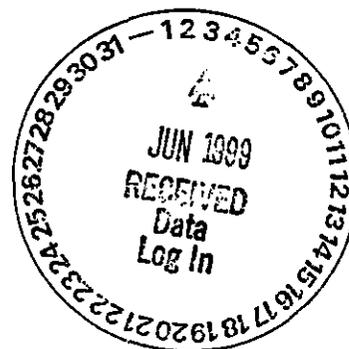
No problems were encountered during the processing of the samples.

2.5 Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

2.6 Americium-241 Analyses

No problems were encountered during the processing of the samples.



Collector Fahlberg/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-3		SAF No. B99-002		
Ice Chest No. SML 579	Field Logbook No. EL 1327-3		Method of Shipment FED EX.		
Shipped To TMA/REGRA RF. 5-4-99	Offsite Property No. A990132		Bill of Lading/Air Bill No. 423579525680		
			COA R16B112600		

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.							

Sample No.	Matrix *	Sample Date	Sample Time									
B0VD41	Soil	5-4-99	1215	X	X				X			into B0VD55
B0VD42	Soil	5-4-99	1243	X	X				X			B0VD56
B0VD43	Soil	5-4-99	1243	X	X				X			B0VD56
B0VD44	Soil	5-4-99	1310	X	X				X			B0VD52

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By R. Fahlberg Date/Time 5-4-99 1615	Received By R. Fahlberg Date/Time 5-4-99 1615	(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) NOTE: COLLECTOR UNAVAILABLE TO SIGN COC	Soil Water Vapor Other Solid Other Liquid
Relinquished By REF 1-2 Date/Time 5699 1030	Received By S JGALE Date/Time 5699 1030		
Relinquished By S JGALE Date/Time 5699 1030	Received By FED EX. Date/Time		
Relinquished By Fed Ex Date/Time 5/7/99 10:00	Received By TNU M. Goldenberg Date/Time 5/7/99 10:00		
LABORATORY SECTION	Received By		Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

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RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	114-B-3		DATA PACKAGE: H0399		
VALIDATOR:	TLI	LAB: TWU	DATE: 6/29/99		
CASE:			SDG: H0399		
ANALYSES PERFORMED					
<input type="checkbox"/> Gross Alpha/Beta	<input checked="" type="checkbox"/> Strontium-90	<input type="checkbox"/> Technetium-99	<input checked="" type="checkbox"/> Alpha Spectroscopy	<input checked="" type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input type="checkbox"/> Tritium	<input checked="" type="checkbox"/> U-23		
SAMPLES/MATRIX	BOVD41	BOVD42	BOVD43	BOVD44	
seal					

1. Completeness N/A

Technical verification forms present? Yes No N/A

Comments: _____

2. Initial Calibration N/A

Instruments/detectors calibrated within one year of sample analysis? Yes No N/A

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

Standards Expired? Yes No N/A

Comments: _____

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: _____

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 user qual

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: _____

- 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: _____

10. Holding Times

- Are sample holding times acceptable? Yes No N/A

Comments: _____

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: EU-152 (41) U-238 (41) U-235 (41) Am-241 Geo (41)
U-238 (42) U-238 (43) U-238 (44)

AR

Duncan, Jeanette M

From: Routt, Tina/RLO [troutt@CH2M.com]
Sent: Wednesday, August 18, 1999 10:21 AM
To: Duncan, Jeanette/RLO-HAN
Subject: Validation Review - H0399, H0387, H0377

Jeanette -

H0387 (B-3) - No comments

H0399 (B-9) - No comments

H0377 (B-12) - Analytical Detection Levels (p. 3). Validator stated that Chromium VI had reported detection limits above TDL in samples B0V1W9 and B0V1X0. This is true, but it is also true for samples B0V1W7 and B0V1W8.

I have already given you my comments on H0393 (B-6B) and H0401 (B-4), and Dave Corbett is reviewing B-2. So, that is all of my comments on validation reports I have received to date.

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

Review Comment Record (RCR)

1. Date

7/26/99

2. Review No.

BHI/QA99010

3. Project

116-B-3

4. Page

Page 1 of 1

5. Document Number(s)/Title(s)

H0399-TNU (SDG No. H0399)

6. Program/Project/
Building Number

100-BC Areas - Full
Protocol - 116-B-3

7. Reviewer

Claude Stacey

8. Organization/Group

BHI/QA

9. Location/Phone

H0-16/372-9208

17. Comment Submittal Approval:

Organization Manager (Optional)

10. Agreement with indicated comment disposition(s)

Date

Reviewer/Point of Contact

Author/Originator

11. CLOSED

8/18/99
Date

Reviewer/Point of Contact

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: No Comments			
2	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 ..."		Per 8/13/99 Carro	
3				
4				

Post-It® Fax Note 7671

Date	8/26/99	# of pages	1
To	J. Duncan	From	C. Stacey
Co./Dept.		Co.	
Phone #	375-9439	Phone #	372-9208
Fax #	372-9487	Fax #	

P. 1/1
AUG 19 '99 03:48PM

Review Comment Record (RCR)

1. Date
7/26/99

2. Review No.
BHI/QA99010

3. Project
116-B-3

4. Page
Page 1 of 1

5. Document Number(s)/Title(s)
H0399-TNU (SDG No. H0399)

6. Program/Project/
Building Number
100-BC Areas - Full
Protocol - 116-B-3

7. Reviewer
Claude Stacey

8. Organization/Group
BHI/QA

9. Location/Phone
H0-16/372-9208

17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)

11. CLOSED

Organization Manager (Optional)

Date

Reviewer/Point of Contact

8/18/99
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: No Comments			
2	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 ..."		<i>Per 8/13/99 Carro</i>	
3				
4				

Post-It® Fax Note	7871	Date	8/19/99	# of pages	1
To	J. Duncan	From	C. Stacey		
Co./Dept.		Co.			
Phone #		Phone #	372-9208		
Fax #	372-9487	Fax #			

AUG 19 '99 03:38PM BHI 509 372 9447



Duncan, Jeanette M

From: Blumenkranz, David B
Sent: Tuesday, July 27, 1999 3:31 PM
To: Duncan, Jeanette M
Cc: Sturges, Mark H; Routt, Tina; Weiss, Richard L
Subject: RE: Data Validation Packages H0401-TNU/RLN and H0399-TNU/RLN

Importance: High

Rich has resolved these comments (see original message) to my satisfaction except for the following, concerning all data validation packages:

Please ask the validator to include all relevant lab QA/QC (MS/MSD, blank, LCS and percent recovery sheets) in attachment 5 so that the data validation will be completely stand-alone and verifiable.

Thanks,
Dave

399
400

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

From: Blumenkranz, David B
Sent: Tuesday, July 27, 1999 9:18 AM
To: Weiss, Richard L
Cc: Sturges, Mark H; Duncan, Jeanette M
Subject: Data Validation Packages H0401
Importance: High

Comments/questions on

- The summary table determined that the lab
- Question for Rich: Th a control limit of less than replicate value is below the soil samples. If the RPD the control limit is a conceal we're comparing apple and concise verbiage? The equ
- Another Question for Rich: correct? I thought that unless lab.

Please contact me ASAP concerning

Dave Blumenkranz
2-9658

To Tina
Rich
Claude

to Review new Rad
+ comment disposition
on chem 8/17

less the validator has ending.

re times the CRDL original or ves the CRDL for d... I sounds like ation sounds like some more

0, is this signed by the

Duncan, Jeanette M

From: Weiss, Richard L
Date: Tuesday, July 20, 1999 3:10 PM
To: Duncan, Jeanette M
Subject: Review of H0399 & H0401 Validation Packages

Jeanette,

Here are my comments on review of these data packages;

99 - Inorganic: No comments

99 - Radiochemistry: Page 3, Field Duplicates; Wrong lab (QES) identified. *pc*

01 - Inorganic: Page 2, Blanks, last line; misspelled "chromium".
Page 4, MDLs; Sample B0VF65 incorrectly identified as missed Cr DL

01 - Radiochemistry: Page 4, Field Duplicates; Wrong lab (QES) identified.
Page 8, Comments; "No qualifiers assigned" not appropriate.

an, Jeanette M

Blumenkranz, David B
Tuesday, July 27, 1999 9:18 AM
Weiss, Richard L
Sturges, Mark H; Duncan, Jeanette M; 'Routt, Tina'
Data Validation Packages H0401-TNU/RLN and H0399-TNU/RLN

ct:

tance: High

ments/questions on Data Validation Packages H0401-TNU/RLN and H0399-TNU/RLN:

he summary table on page 10 needs to match the lab data in terms of significant figures, unless the validator has determined that the lab measurement is not accurate and the result required truncation or rounding.

~~Question for Rich: The discussion of RPDs on p. 3 states, "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...If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to...two times the CRDL for soil samples. If the RPD is outside the applicable control limit, the associated results are qualified..." I sounds like the control limit is a concentration based number, but the RPD is in percent, therefore, this description sounds like we're comparing apple and oranges. Can we ask for a clearer description or provide the validator some more concise verbiage? The equivalent situation is found in the inorganics data package as well.~~

~~Another Question for Rich: Lab qualifiers were not carried forward onto the summary table on p. 10, is this correct? I thought that unless they were negated by the validation, the data should have qualifiers assigned by the lab.~~

~~se contact me ASAP concerning this message. This is a priority validation and supports PSCI activities.~~

~~ve Blumenkranz~~

~~is~~

Review Comment Record (RCR)

1. Date
7/26/99

2. Review No.
BHI/QA99010

3. Project
116-B-3

4. Page
Page 1 of 1

5. Document Number(s)/Title(s)

H0399-TNU (SDG No. H0399)

6. Program/Project/
Building Number

100-BC Areas - Full
Protocol - 116-B-3

7. Reviewer

Claude Stacey

8. Organization/Group

BHI/QA

9. Location/Phone

H0-16/372-9208

17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)

11. CLOSED

Organization Manager (Optional)

Date

Reviewer/Point of Contact

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: No Comments			
2	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 ..."		<p><i>RC</i> 8/13/99 <i>Carro</i></p>	
3				
4				

Recre LabWet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/19/99

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

RECRA LOT #: 9905L907

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	99L0295-MB1	Chromium, Total	0.35 u	MG/KG	0.35	1.0
		Lead, Total	4.1 u	MG/KG	4.1	1.0
BLANK1	99C0139-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

Inorganic
QC pages

000022

~~006~~

Recre LabNet - Lionville

INORGANICS ACCURACY REPORT 05/19/99

CLIENT: TWU-HANFORD B99-002

RECRA LOT #: 9905L907

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

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-001	BOVD41	Chromium, Total	27.4	9.4	18.8	95.7	1.0
		Mercury, Total	0.19	0.02u	0.17	112.1	1.0
		Lead, Total	44.0	5.4	46.9	82.3	1.0

000023

007

Recre LabNet - Lionville

INORGANICS PRECISION REPORT 05/19/99

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

RECRA LOT #: 9905L907

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-001REP	BOVD41	Chromium, Total	9.4	9.6	2.1	1.0
		Mercury, Total	0.02u	0.02u	NC	1.0
		Lead, Total	5.4	3.8 u	NC-200	1.0

Correction
MPS
5/19/99

000024

2074
5/19/99

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/14/99

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

RECRA LOT #: 9905L907

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LVI038-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 05/14/99

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

RECRA LOT #: 9905L907

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR(SPK)
-004	BOVD44	Soluble Chromium VI	4.1	0.204u	4.1	104.2	1.0
		Insoluble Chromium VI	1240	0.204u	1200	103.6	100
BLANK10	99LV103a-MB1	Soluble Chromium VI	3.7	0.40u	4.0	93.1	1.0
		Insoluble Chromium VI	1290	0.40u	1160	110.6	100

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 05/14/99

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

RECRA LOT #: 9905L907

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR (REP)
-004REP	BOVD44	Chromium VI	0.41u	0.41u	NC	1.0

000027

0072

Date: 20 July 1999
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Areas - Full Protocol - Waste Site 116-B-3
Subject: Inorganics - Data Package No. H0399-RLN (SDG No. H0399)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0399-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
B0VD41	5/4/99	Soil	C	See note 1
B0VD42	5/4/99	Soil	C	See note 1
B0VD43	5/4/99	Soil	C	See note 1
B0VD44	5/4/99	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) months for lead & total chromium; 30 days for chrome VI; and 28 days for mercury.

All holding times were acceptable.

000001

- **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 reporting limit for lead and chromium VI exceeded the target detection limit (TDL).

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

All matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

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".

All laboratory duplicate results were acceptable.

Field Duplicates

One sample duplicate pair (BOVD42/BOVD43) was submitted for analysis. The samples were compared using the same criteria as for a laboratory duplicate. The RPD for lead was outside QC limits (48%). 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: Lead in samples BOVD42 and BOVD44; and chromium VI in all samples. 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. H0399-QES (SDG No. H0399) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

000003

MINOR DEFICIENCIES

The following had reported detection limits above their TDL: Lead in samples BOVD42 and BOVD44; and chromium VI in all samples. 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.

Appendix 1

Glossary of Data Reporting Qualifiers

000005

Qualifiers which may be applied by data validators in compliance with BHI validation SOW are as follows:

- U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.
- UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a 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).

000006

Appendix 2

Summary of Data Qualification

000007

DATA QUALIFICATION SUMMARY

SDG: H0399	REVIEWER: TLI	DATE: 7/20/99	PAGE <u>1</u> OF <u>1</u>
COMMENTS: No qualifiers assigned			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000009

Recre LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 05/19/99

CLIENT: TNU-HANFORD B99-002
 WORK ORDER: 10905-001-001-9999-00

RECRA LOT #: 9905L907

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
-001	BOVD41	Chromium, Total	9.4	MG/KG	0.31	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	5.4	MG/KG	3.6	1.0
-002	BOVD42	Chromium, Total	8.8	MG/KG	0.31	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Lead, Total	3.6 u	MG/KG	3.6	1.0
-003	BOVD43	Chromium, Total	10.4	MG/KG	0.34	1.0
		Mercury, Total	0.02	MG/KG	0.02	1.0
		Lead, Total	5.9	MG/KG	4.0	1.0
-004	BOVD44	Chromium, Total	6.4	MG/KG	0.33	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.8 u	MG/KG	3.8	1.0

*per
 6/24/99*

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Recre LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 05/14/99

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

RECRA LOT #: 9905L907

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0VD41	‡ Solids	96.0	‡	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-002	B0VD42	‡ Solids	96.8	‡	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-003	B0VD43	‡ Solids	97.3	‡	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0
-004	B0VD44	‡ Solids	97.3	‡	0.01	1.0
		Chromium VI	0.41 u	MG/KG	0.41	1.0

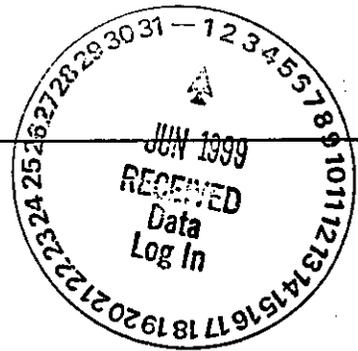
000012

Handwritten:
 jmc
 6/30/99
 004k

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013



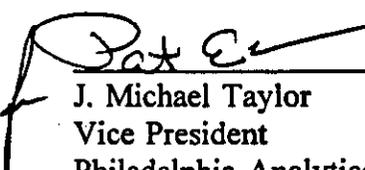
**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-002
RFW# : 9905L907
SDG# : H0399
SAF# : B99-002

W.O. # : 10985-001-001-9999-00
Date Received: 05-07-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 4 soil samples.
2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The cooler 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 analysis for Chromium VI was 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

5-27-99
Date

njpli05-907

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 10 pages.

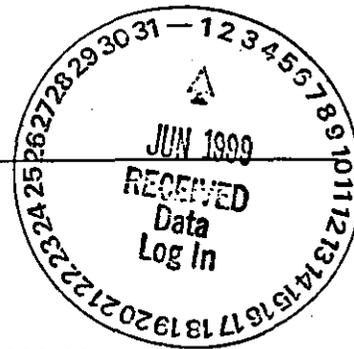




**RECRA
LabNet**

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere



**Recra LabNet Philadelphia
Analytical Report**

**Client : TNU-HANFORD B99-002
RFW# : 9905L907
SDG/SAF# : H0399/B99-002**

**W.O.# : 10985-001-001-9999-00
Date Received: 05-07-99**

METALS CASE NARRATIVE

1. This narrative covers the analyses of 4 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. 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 (MB) 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. All matrix spike (MS) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.
11. The duplicate analysis for 1 analyte was 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 13 pages.

12. For the purposes of this report, the data has been reported to the Instrument Detection Limit (IDL). Values between the IDL and the Practical Quantitation Limit (PQL) are acquired in a region of less-certain quantification.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

mld/ms05-907

5-20-99
Date



000016



Collector: Fahlberg/Kerkow Company Contact: R Coffman Telephone No.: 373-6425 Project Coordinator: TRENT, SJ Price Code: **907** Data Turnaround: 15 Days

Project Designation: 100 B/C Areas - Full Protocol Sampling Location: 100 B/C 116-B-3 SAF No.: B99-002

Ice Chest No.: **SML-598** Field Logbook No.: EL 1327-3 Method of Shipment: **FED EX**

Shipped To: **TMA/RECRA R.F. 5-4-99** Offsite Property No.: **A990133** Bill of Lading/Air Bill No.: **423579525691 - 2.50C**

COA: **R16B112600**

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						
-----------------	---------------	--------------------------------------	---------------------	---	--------------------------------------	--	--	--	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time								
B0VD41	Soil	5-4-99	1215			X	X				
B0VD42	Soil	5-4-99	1243			X	X				
B0VD43	Soil	5-4-99	1243			X	X				
B0VD44	Soil	5-4-99	1310			X	X				

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By: R. Fahlberg Date/Time: 5-4-99 1615	Received By: R. Fahlberg Date/Time: 5-4-99 1615	(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) NOTE; COLLECTOR UNAVAILABLE TO SIGN COC	Soil Water Vapor Other Solid Other Liquid
Relinquished By: REF 1-C Date/Time: 5-6-99 1030	Received By: SJGALE Date/Time: 5-6-99 1030		
Relinquished By: SJGALE Date/Time: 5-6-99 1030	Received By: FED EX Date/Time: 5-6-99 1030		
Relinquished By: Jedup Date/Time: 5-7-99 1000	Received By: Jedup Date/Time: 5-7-99 1000		

Appendix 5

Data Validation Supporting Documentation

000018

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT:	116-B-3		DATA PACKAGE: H0399		
VALIDATOR:	TLI	LAB: RECRA Labnet	DATE: 6/29/99		
CASE:			SDG: H0399		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP/PCP	<input type="checkbox"/> CLP/GFAA	<input type="checkbox"/> CLP/Hg	<input type="checkbox"/> CLP/Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> SW-846/PCP	<input type="checkbox"/> SW-846/GFAA	<input checked="" type="checkbox"/> SW-846/Hg	<input type="checkbox"/> SW-846 Cyanide	<input checked="" type="checkbox"/> CR II	<input type="checkbox"/>
SAMPLES/MATRIX	BOVD41	BOVD42	BOVD43	BOVD44	
soil					

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: sampled 3/4/99

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: Lead - CRDT ~~blank~~ blank 2x TDL 4x TDL } in hand

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: _____

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: head IR - hand written 200%
Level (FR) - 48% RPD

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: head - all data CRDL all over
42+44 over

FAX

TECHLAW, INC.

451 Hills, Suite 23
Richland, WA 99352
509-375-5667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 23 July 1999

Information Request

H0399 - Radiochemistry

Gamma scan - method summaries, page 6, the blank and the duplicate were not run with the SDG.

Blank - Run on following Monday

*Page - Val procedure does not require qualification
if dup not run with batch. Note in
validation narrative*

*R. J. Wilson
8-11-99*

FAX

TECHLAW, INC.

**451 Hills, Suite 23
Richland, WA 99352
509-375-5667
509-375-5151 (fax)**

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 23 July 1999

Information Request

H0399 - Radiochemistry

Gamma scan - method summaries, page 6, the blank and the duplicate were not run with the SDG.

<h1>Review Comment Record (RCR)</h1>	1. Date 7/26/99	2. Review No. BHI/QA99010
	3. Project 116-B-3	4. Page Page 1 of 1

5. Document Number(s)/Title(s) H0399-TNU (SDG No. H0399)	6. Program/Project/ Building Number 100-BC Areas - Full Protocol - 116-B-3	7. Reviewer Claude Stacey	8. Organization/Group BHI/QA	9. Location/Phone H0-16/372-9208
---	---	----------------------------------	-------------------------------------	---

17. Comment Submittal Approval: _____ 10. Agreement with indicated comment disposition(s) _____ 11. CLOSED

_____ Organization Manager (Optional) _____ Date _____ Reviewer/Point of Contact _____ 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: No Comments			
2	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 ..."			
3				
4				

Duncan, Jeanette M

From: Weiss, Richard L
Sent: Tuesday, July 20, 1999 3:10 PM
To: Duncan, Jeanette M
Subject: Review of H0399 & H0401 Validation Packages

Jeanette,

Here are my comments on review of these data packages;

H0399 - Inorganic: No comments

H0399 - Radiochemistry: Page 3, Field Duplicates; Wrong lab (QES) identified.

H0401 - Inorganic: Page 2, Blanks, last line; misspelled "chromium".
Page 4, MDLs; Sample B0VF65 incorrectly identified as missed Cr DL.

H0401 - Radiochemistry: Page 4, Field Duplicates; Wrong lab (QES) identified.
Page 8, Comments; "No qualifiers assigned" not appropriate.

Rich

FAX

TECHLAW, INC.

**451 Hills, Suite 23
Richland, WA 99352
509-375-5667
509-375-5151 (fax)**

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 22 July 1999

Information Request

H0399 - Radiochemistry

Method summaries, page 6, the blank and the duplicate were not run with the SDG.

FAX

TECHLAW, INC.

451 Hills, Suite 23
Richland, WA 99352
509-375-5667
509-375-5151 (fax)

To: Jeanette Duncan

From: Bruce Christian

Pages: 1

Date: 29 June 1999

Information Request

110399 - Inorganics

For lead the lab reports the RPD as 200, I calculate it at 35. Is the data reported by the lab accurate?

*Use report values as needed. Lab
calculated RPD is not correct*

R2W 7-6-99