

Date: 22 July 1999
 To: Bechtel Hanford, Inc. (technical representative)
 From: TechLaw, Inc.
 Project: 100-BC Areas - Full Protocol - Waste Site 116-B-6B
 Subject: Radiochemistry - Data Package No. H0393-TNU (SDG No. H0393)

RECEIVED
 APR 25 2000

INTRODUCTION

This memo presents the results of data validation on Summary **EDMO** Package No. H0393-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
B0VD36	04/27/99	Soil	C	See note 1
B0VD37	04/27/99	Soil	C	See note 1
B0VD38	04/27/99	Soil	C	See note 1
B0VD39	04/27/99	Soil	C	See note 1
B0VDB2	04/27/99	Soil	C	See note 1
B0VDB3	04/27/99	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 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-238 exceeded the target detection limit (TDL).

Equipment Blanks

One equipment blank (BOVDB2) was submitted for analysis. Uranium-233/234, uranium-238 (alpha spec), 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 ± 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

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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 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.

All duplicate results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples (samples BOVD38/BOVD39) 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 and europium-155 in samples BOVD36, BOVD39 and BOVDB3. 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. H0393 (SDG No. H0393) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The reported detection limit exceeded the TDL for uranium-238 (GEA) in all samples and europium-155 in samples BOVD36, BOVD39 and BOVDB3. 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.

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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 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: H0393	REVIEWER: TLI	DATE: 7/22/99	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

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Project: BECHTEL-HANFORD																
Laboratory: TNU																
Case		SDG: H0393														
Sample Number	B0VD36		B0VD37		B0VD38		B0VD39		B0VDB2		B0VDB3					
Location	116-B-6B		116-B-6B		116-B-6B		116-B-6B		116-B-6B		116-B-6B					
Remarks	A1		A2		A3		Duplicate		Equip. Blank		A4					
Sample Date	04/27/99		04/27/99		04/27/99		04/27/99		04/27/99		04/27/99					
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
Uranium-234	0.1	0.593		0.559		0.53		0.404		0.204		0.44				
Uranium-235	0.1	0.032	U	0.048	U	0.031	U	0.013	U	0	U	0.029	U			
Uranium-238	0.1	0.567		0.392		0.59		0.644		0.155		0.624				
Plutonium-238	0.1	0.012	U	-0.008	U	0	U	0.006	U	-0.004	U	-0.003	U			
Plutonium-239/40	0.1	-0.004	U	0.011	U	0.004	U	0.006	U	0.008	U	-0.003	U			
Nickel-63	30	-0.4	U	-0.471	U	-2.09	U	-0.22	U	-1.28	U	-0.886	U			
Americium-241	0.1	0.005	U	-0.011	U	-0.013	U	-0.007	U	0.004	U	0.017	U			
Strontium (total)	1	-0.035	U	0.033	U	0.023	U	-0.056	U	-0.035	U	-0.071	U			
Potassium-40		12.5		13.5		13		12.5		5.1		12.3				
Cobalt 60	0.05		U U		U U		U U		U U		U U		U U			
Cesium 137	0.05		U U	0.03		0.025			U U		U U		U U			
Europium 152	0.1		U U		U U		U U		U U		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		0.424		0.46		0.44		0.455		0.135		0.4				
Radium-228		0.784		0.767		0.69		0.691		0.176		0.644				
Thorium-228		0.637		0.698		0.65		0.632		0.172		0.629				
Thorium-232		0.784		0.767		0.69		0.691		0.176		0.644				
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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 SAMPLE DELIVERY GROUP H0393

N904152-01

BOVD36

DATA SHEET

SDG <u>7118</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0393</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904152-01</u>	Client sample id <u>BOVD36</u>	
Dept sample id <u>7118-001</u>	Location/Matrix <u>SOLID</u>	
Received <u>04/29/99</u>	Collected <u>04/27/99 09:30</u>	
* solids <u>95.1</u>	Custody/SAF No <u>B99-002-87</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	0.593	0.15	0.067	0.30		U
Uranium 235	15117-96-1	0.032	0.042	0.081	0.30	U	U
Uranium 238	U-238	0.567	0.15	0.067	0.30		U
Plutonium 238	13981-16-3	0.012	0.023	0.042	0.050	U	PU
Plutonium 239/240	PU-239/240	-0.004	0.015	0.037	0.050	U	PU
Nickel 63	13981-37-8	-0.400	1.1	1.9	20	U	NI_L
Americium 241	14596-10-2	0.005	0.028	0.045	0.050	U	AM
Total Strontium	SR-RAD	-0.035	0.13	0.22	1.0	U	SR
Potassium 40	13966-00-2	12.5	0.43	0.19			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	U		0.021	0.050	U	GAM
Europium 152	14683-23-9	U		0.044	0.10	U	GAM
Europium 154	15585-10-1	U		0.070	0.10	U	GAM
Europium 155	14391-16-3	U		0.058	0.10	U	GAM
Radium 226	13982-63-3	0.424	0.037	0.035	0.10		GAM
Radium 228	15262-20-1	0.784	0.10	0.093	0.20		GAM
Thorium 228	14274-82-9	0.637	0.022	0.020			GAM
Thorium 232	TH-232	0.784	0.10	0.093			GAM
Americium 241	14596-10-2	U		0.025		U	GAM
Uranium 238	U-238	U		2.6		U	GAM
Uranium 235	15117-96-1	U		0.064		U	GAM

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Protocol	<u>Hanford</u>
Version	<u>Ver 1.0</u>
Form	<u>DVD-DS</u>
Version	<u>3.06</u>
Report date	<u>06/01/99</u>

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 SAMPLE DELIVERY GROUP H0393

N904152-02

BOVD37

DATA SHEET

SDG <u>7118</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0393</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904152-02</u>	Client sample id <u>BOVD37</u>	
Dept sample id <u>7118-002</u>	Location/Matrix <u>100 B/C 116-B-6B</u>	<u>SOLID</u>
Received <u>04/29/99</u>	Collected <u>04/27/99 10:00</u>	
% solids <u>95.9</u>	Custody/SAF No <u>B99-002-87</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	0.559	0.14	0.061	0.30		U
Uranium 235	15117-96-1	0.048	0.039	0.074	0.30	U	U
Uranium 238	U-238	0.392	0.12	0.061	0.30		U
Plutonium 238	13981-16-3	-0.008	0.015	0.047	0.050	U	PU
Plutonium 239/240	PU-239/240	0.011	0.015	0.029	0.050	U	PU
Nickel 63	13981-37-8	-0.471	1.4	2.5	20	U	NI_L
Americium 241	14596-10-2	-0.011	0.034	<u>0.069</u>	0.050	U	AM
Total Strontium	SR-RAD	0.033	0.12	0.20	1.0	U	SR
Potassium 40	13966-00-2	13.5	0.44	0.21			GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Cesium 137	10045-97-3	0.030	0.019	0.022	0.050	J	GAM
Europium 152	14683-23-9	U		0.046	0.10	U	GAM
Europium 154	15585-10-1	U		0.063	0.10	U	GAM
Europium 155	14391-16-3	U		0.050	0.10	U	GAM
Radium 226	13982-63-3	0.460	0.034	0.035	0.10		GAM
Radium 228	15262-20-1	0.767	0.093	0.094	0.20		GAM
Thorium 228	14274-82-9	0.698	0.025	0.022			GAM
Thorium 232	TH-232	0.767	0.093	0.094			GAM
Americium 241	14596-10-2	U		0.075		U	GAM
Uranium 238	U-238	U		2.3		U	GAM
Uranium 235	15117-96-1	U		0.081		U	GAM

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Report date	<u>06/01/99</u>

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SAMPLE DELIVERY GROUP H0393

N904152-03

BOVD38

DATA SHEET

SDG <u>7118</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0393</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904152-03</u>	Client sample id <u>BOVD38</u>	
Dept sample id <u>7118-003</u>	Location/Matrix <u>100 B/C 116-B-6B</u>	<u>SOLID</u>
Received <u>04/29/99</u>	Collected <u>04/27/99 10:15</u>	
% solids <u>95.1</u>	Custody/SAF No <u>B99-002-87</u>	<u>B99-002</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233/234	U-233/234	0.530	0.14	0.065	0.30		U
Uranium 235	15117-96-1	0.031	0.042	0.079	0.30	U	U
Uranium 238	U-238	0.590	0.15	0.065	0.30		U
Plutonium 238	13981-16-3	0	0.017	0.041	0.050	U	PU
Plutonium 239/240	PU-239/240	0.004	0.017	0.033	0.050	U	PU
Nickel 63	13981-37-8	<u>-2.09</u>	1.3	2.4	20	U	NI_L
Americium 241	14596-10-2	<u>-0.013</u>	0.026	<u>0.073</u>	0.050	U	AM
Total Strontium	SR-RAD	0.023	0.12	0.17	1.0	U	SR
Potassium 40	13966-00-2	13.0	0.26	0.10			GAM
Cobalt 60	10198-40-0	U		0.011	0.050	U	GAM
Cesium 137	10045-97-3	0.025	0.007	0.010	0.050	J	GAM
Europium 152	14683-23-9	U		0.026	0.10	U	GAM
Europium 154	15585-10-1	U		0.035	0.10	U	GAM
Europium 155	14391-16-3	U		0.039	0.10	U	GAM
Radium 226	13982-63-3	0.440	0.022	0.021	0.10		GAM
Radium 228	15262-20-1	0.690	0.053	0.051	0.20		GAM
Thorium 228	14274-82-9	0.650	0.015	0.014			GAM
Thorium 232	TH-232	0.690	0.053	0.051			GAM
Americium 241	14596-10-2	U		0.035		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Uranium 235	15117-96-1	U		0.057		U	GAM

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 SAMPLE DELIVERY GROUP H0393

N904152-04

BOVD39

DATA SHEET

SDG <u>7118</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0393</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904152-04</u>	Client sample id <u>BOVD39</u>	
Dept sample id <u>7118-004</u>	Location/Matrix <u>100 B/C 116-B-6B</u>	<u>SOLID</u>
Received <u>04/29/99</u>	Collected <u>04/27/99 10:15</u>	
% solids <u>95.1</u>	Custody/SAF No <u>B99-002-87</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	0.404	0.14	0.084	0.30		U
Uranium 235	15117-96-1	0.013	0.026	0.10	0.30	U	U
Uranium 238	U-238	0.644	0.19	0.084	0.30		U
Plutonium 238	13981-16-3	0.006	0.033	<u>0.061</u>	0.050	U	PU
Plutonium 239/240	PU-239/240	0.006	0.022	0.042	0.050	U	PU
Nickel 63	13981-37-8	-0.220	1.4	2.4	20	U	NI_L
Americium 241	14596-10-2	-0.007	0.028	<u>0.066</u>	0.050	U	AM
Total Strontium	SR-RAD	-0.056	0.11	0.17	1.0	U	SR
Potassium 40	13966-00-2	12.5	0.51	0.25			GAM
Cobalt 60	10198-40-0	U		0.023	0.050	U	GAM
Cesium 137	10045-97-3	U		0.024	0.050	U	GAM
Europium 152	14683-23-9	U		0.058	0.10	U	GAM
Europium 154	15585-10-1	U		0.074	0.10	U	GAM
Europium 155	14391-16-3	U		0.073	0.10	U	GAM
Radium 226	13982-63-3	0.455	0.047	0.045	0.10		GAM
Radium 228	15262-20-1	0.691	0.084	0.081	0.20		GAM
Thorium 228	14274-82-9	0.632	0.028	0.027			GAM
Thorium 232	TH-232	0.691	0.084	0.081			GAM
Americium 241	14596-10-2	U		0.088		U	GAM
Uranium 238	U-238	U		2.9		U	GAM
Uranium 235	15117-96-1	0.087	0.063	0.091		U	GAM

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TMA / RICHMOND
 SAMPLE DELIVERY GROUP H0393

N904152-05

BOVDB2

DATA SHEET

SDG <u>7118</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0393</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904152-05</u>	Client sample id <u>BOVDB2</u>	
Dept sample id <u>7118-005</u>	Location/Matrix <u>100 B/C 116-B-6B</u>	<u>SOLID</u>
Received <u>04/29/99</u>	Collected <u>04/27/99 08:30</u>	
% solids <u>99.9</u>	Custody/SAF No <u>B99-002-93</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	0.204	0.083	0.062	0.30	J	U
Uranium 235	15117-96-1	0	0.020	0.075	0.30	U	U
Uranium 238	U-238	0.155	0.066	0.062	0.30	J	U
Plutonium 238	13981-16-3	-0.004	0.015	0.043	0.050	U	PU
Plutonium 239/240	PU-239/240	0.008	0.015	0.030	0.050	U	PU
Nickel 63	13981-37-8	<u>-1.28</u>	1.1	1.9	20	U	NI_L
Americium 241	14596-10-2	0.004	0.024	0.039	0.050	U	AM
Total Strontium	SR-RAD	-0.035	0.14	0.19	1.0	U	SR
Potassium 40	13966-00-2	5.10	0.18	0.064			GAM
Cobalt 60	10198-40-0	U		0.008	0.050	U	GAM
Cesium 137	10045-97-3	U		0.007	0.050	U	GAM
Europium 152	14683-23-9	U		0.019	0.10	U	GAM
Europium 154	15585-10-1	U		0.027	0.10	U	GAM
Europium 155	14391-16-3	U		0.021	0.10	U	GAM
Radium 226	13982-63-3	0.135	0.015	0.015	0.10		GAM
Radium 228	15262-20-1	0.176	0.036	0.037	0.20	J	GAM
Thorium 228	14274-82-9	0.172	0.009	0.009			GAM
Thorium 232	TH-232	0.176	0.036	0.037			GAM
Americium 241	14596-10-2	U		0.024		U	GAM
Uranium 238	U-238	U		0.95		U	GAM
Uranium 235	15117-96-1	U		0.032		U	GAM

100 BC Areas-Full Protocol

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DATA SHEETS

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Protocol <u>Hanford</u>
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0393

N904152-06

BOVDB3

DATA SHEET

SDG <u>7118</u>	Client/Case no <u>Hanford</u>	SDG- <u>H0393</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRE-SBB-207925</u>	
Lab sample id <u>N904152-06</u>	Client sample id <u>BOVDB3</u>	
Dept sample id <u>7118-006</u>	Location/Matrix <u>100 B/C 116-B-6B</u>	<u>SOLID</u>
Received <u>04/29/99</u>	Collected <u>04/27/99 10:45</u>	
% solids <u>97.2</u>	Custody/SAF No <u>B99-002-93</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	0.440	0.13	0.061	0.30		U
Uranium 235	15117-96-1	0.029	0.039	0.074	0.30	U	U
Uranium 238	U-238	0.624	0.15	0.061	0.30		U
Plutonium 238	13981-16-3	-0.003	0.014	0.039	0.050	U	PU
Plutonium 239/240	PU-239/240	-0.003	0.014	0.033	0.050	U	PU
Nickel 63	13981-37-8	-0.886	1.9	3.3	20	U	NI_L
Americium 241	14596-10-2	0.017	0.035	<u>0.064</u>	0.050	U	AM
Total Strontium	SR-RAD	-0.071	0.11	0.16	1.0	U	SR
Potassium 40	13966-00-2	12.3	0.53	0.30			GAM
Cobalt 60	10198-40-0	U		0.021	0.050	U	GAM
Cesium 137	10045-97-3	U		0.022	0.050	U	GAM
Europium 152	14683-23-9	U		0.057	0.10	U	GAM
Europium 154	15585-10-1	U		0.072	0.10	U	GAM
Europium 155	14391-16-3	U		0.060	0.10	U	GAM
Radium 226	13982-63-3	0.400	0.043	0.044	0.10		GAM
Radium 228	15262-20-1	0.644	0.11	0.11	0.20		GAM
Thorium 228	14274-82-9	0.629	0.030	0.029			GAM
Thorium 232	TH-232	0.644	0.11	0.11			GAM
Americium 241	14596-10-2	U		0.087		U	GAM
Uranium 238	U-238	U		2.8		U	GAM
Uranium 235	15117-96-1	U		0.094		U	GAM

100 BC Areas-Full Protocol

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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 H0393 is comprised 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. All results were reported by fax on May 19, 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

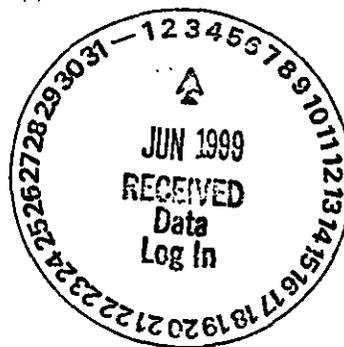
No problems were encountered during the processing of the samples.

2.5 Isotopic Uranium Analyses

No problems were encountered during the processing of the samples.

2.6 Americium-241 Analyses

The aliquot for the analysis was reduced however this did not affect achieving the required LLD. 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 CPY	Date Turnaround 15 Days
Project Designation 100 BC Areas - Full Protocol	Sampling Location 100 B/C 116-B-6B	SAF No. B99-002			
Ice Chest No. # 740	Field Logbook No. EL 1327-3	Method of Shipment Fed Ex			
Shipped To TMA/REGM RC 4.27.99	Offsite Property No. A990124	Bill of Lading/Air Bill No. 423579525305			
			COA R16B6B2600		

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									
BOVD36	Soil	4.27.99	0930	X	X			X				fieta BOV013
BOVD37	Soil	4.27.99	1000	X	X			X				BOV016
BOVD38	Soil	4.27.99	1015	X	X			X				BOV018
BOVD39	Soil	4.27.99	1015	X	X			X				BOV018

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By R Fahlberg	Date/Time 4.27.99 1620	(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)	Soil Water Vapor Other Solid Other Liquid
Received By R Fahlberg	Date/Time 4.27.99 1620		
Relinquished By R Fahlberg	Date/Time 4/28/99 0930		
Received By R Nelson	Date/Time 4/28/99 0930		
Relinquished By R Nelson	Date/Time 4/28/99 0930		
Received By Fed Ex	Date/Time 4/28/99		
Relinquished By Fed Ex	Date/Time 4/29/99 10:15		
Received By TNU M. Goldenberg	Date/Time 4/29/99 10:15		
LABORATORY SECTION	Received By	Title	Date/Time
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

000019

Company Contact Fahlberg/Kerkow R Coffman	Telephone No. 373-6425	Project Coordinator TRENT, SJ	Price Code COP2	Data Turnaroun 15 Days
Project Designation 100 BC Areas - Full Protocol	Sampling Location 100 B/C 116-B-6B	SAF No. 899-002		
Ice Chest No. #740	Field Logbook No. EL 1327-3	Method of Shipment Fed Ex		
Shipped To TMA/RECRA RS 4.27.99	Offsite Property No. A990124	Bill of Lading/Air Bill No. 423579525305		
			COA	R16B6B2600

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									
BOVDB2	Soil	4-27-99	08:30	X	X			X				
BOVDB3	Soil	4-27-99	10:45	X	X			X				tie to BOVOX4

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By R. Fahlberg Date/Time 4-27-99 16:20	Received By Ref 1-C Date/Time 4-27-99 16:20	(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)	Soil Water Vapor Other Solid Other Liquid
Relinquished By Ref 1-C Date/Time 4/28/99 09:30	Received By Kene Nielson / R. Nielson Date/Time 4/28/99 09:30		
Relinquished By Kene Nielson / R. Nielson Date/Time 4/28/99 09:30	Received By Fed Ex Date/Time 4/28/99		
Relinquished By Fed Ex Date/Time 4/29/99 10:15	Received By TNU M. Goldenberg Date/Time 4/29/99 10:15		

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

000020

Appendix 5
Data Validation Supporting Documentation

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- 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: U238 # above TDL
EB BOND B2 - U233/34 U238 (Aspac) K-40
PA 226 + 228 Th 228 + 232

- 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 yield

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: U 238 (gpa) all EU-155 D36, D37 D33

ABC

TMA / RICHMOND
 SAMPLE DELIVERY GROUP H0393

N904152-08

Method Blank

METHOD BLANK

SDG <u>7118</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0393</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904152-08</u>	Client sample id <u>Method Blank</u>	
Dept sample id <u>7118-008</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	0.020	0.077	0.30	U	U
Uranium 235	15117-96-1	0	0.024	0.093	0.30	U	U
Uranium 238	U-238	0	0.020	0.077	0.30	U	U
Plutonium 238	13981-16-3	0	0.008	0.019	0.050	U	PU
Plutonium 239/240	PU-239/240	0.002	0.008	0.015	0.050	U	PU
Nickel 63	13981-37-8	-0.368	1.2	2.0	20	U	NI_L
Americium 241	14596-10-2	-0.002	0.014	0.029	0.050	U	AM
Total Strontium	SR-RAD	-0.011	0.13	0.20	1.0	U	SR
Potassium 40	13966-00-2	U		0.10		U	GAM
Cobalt 60	10198-40-0	U		0.010	0.050	U	GAM
Cesium 137	10045-97-3	U		0.008	0.050	U	GAM
Europium 152	14683-23-9	U		0.020	0.10	U	GAM
Europium 154	15585-10-1	U		0.030	0.10	U	GAM
Europium 155	14391-16-3	U		0.010	0.10	U	GAM
Americium 241	14596-10-2	U		0.006		U	GAM
Uranium 238	U-238	U		1.0		U	GAM
Uranium 235	15117-96-1	U		0.020		U	GAM

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QC-BLANK 30665

METHOD BLANKS

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TMA/RICHMOND
 SAMPLE DELIVERY GROUP H0393

N904152-07

Lab Control Sample

LAB CONTROL SAMPLE

SDG <u>7118</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0393</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N904152-07</u>	Client sample id <u>Lab Control Sample</u>	
Dept sample id <u>7118-007</u>	Material/Matrix <u>SOLID</u>	
	SAF No <u>B99-002</u>	

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Uranium 233/234	5.05	0.60	0.27	0.30	U	4.75	0.19	106	79-121	80-120
Uranium 235	3.84	0.51	0.077	0.30	U	3.89	0.16	99	78-122	80-120
Uranium 238	5.12	0.60	0.26	0.30	U	4.90	0.20	104	79-121	80-120
Plutonium 238	4.83	0.33	0.018	0.050	PU	5.03	0.20	96	86-114	80-120
Plutonium 239/240	5.18	0.35	0.014	0.050	PU	5.29	0.21	98	86-114	80-120
Nickel 63	159	4.4	2.4	20	NI_L	134	5.4	119	81-119	
Americium 241	4.57	0.36	0.026	0.050	AM	4.79	0.19	95	85-115	80-120
Total Strontium	12.0	0.42	0.20	1.0	SR	11.4	0.46	105	82-118	
Cobalt 60	0.280	0.016	0.008	0.050	GAM	0.303	0.012	92	77-123	80-120
Cesium 137	0.320	0.013	0.008	0.050	GAM	0.347	0.014	92	78-122	80-120

100 BC Areas-Full Protocol

QC-LCS 30664

000027

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>06/01/99</u>

TMA/RICHMOND
SAMPLE DELIVERY GROUP H0393

N904152-09

BOVD36

DUPLICATE

SDG <u>7118</u>	Client/Case no <u>Hanford</u>	<u>SDG-H0393</u>
Contact <u>L.A. Johnson</u>	Case no <u>TRE-SBB-207925</u>	
DUPLICATE	ORIGINAL	
Lab sample id <u>N904152-09</u>	Lab sample id <u>N904152-01</u>	Client sample id <u>BOVD36</u>
Dept sample id <u>7118-009</u>	Dept sample id <u>7118-001</u>	Location/Matrix <u>SOLID</u>
% solids <u>95.1</u>	Received <u>04/29/99</u>	Collected <u>04/27/99 09:30</u>
	% solids <u>95.1</u>	Custody/SAF No <u>B99-002-87</u> <u>B99-002</u>

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- PIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI- PIERS	RPD %	3σ TOT	PROT LIMIT
Uranium 233/234	0.490	0.14	0.066	0.30	U	U	0.593	0.15	0.067	U	19	58	
Uranium 235	0.052	0.042	0.080	0.30	U	U	0.032	0.042	0.081	U	-		
Uranium 238	0.421	0.13	0.066	0.30	U	U	0.567	0.15	0.067	U	30	61	
Plutonium 238	-0.014	0.018	<u>0.056</u>	0.050	U	PU	0.012	0.023	0.042	U	-		
Plutonium 239/240	0.005	0.018	0.035	0.050	U	PU	-0.004	0.015	0.037	U	-		
Nickel 63	0.263	1.5	2.6	20	U	NI_L	-0.400	1.1	1.9	U	-		
Americium 241	0.024	0.029	0.046	0.050	U	AM	0.005	0.028	0.045	U	-		
Total Strontium	-0.070	0.12	0.20	1.0	U	SR	-0.035	0.13	0.22	U	-		
Potassium 40	12.0	0.43	0.20			GAM	12.5	0.43	0.19		4	33	
Cobalt 60	U		0.020	0.050	U	GAM	U		0.022	U	-		
Cesium 137	U		0.050	0.050	U	GAM	U		0.021	U	-		
Europium 152	U		0.050	0.10	U	GAM	U		0.044	U	-		
Europium 154	U		0.060	0.10	U	GAM	U		0.070	U	-		
Europium 155	U		0.050	0.10	U	GAM	U		0.058	U	-		
Radium 226	0.430	0.037	0.040	0.10		GAM	0.424	0.037	0.035		1	37	
Radium 228	0.730	0.094	0.090	0.20		GAM	0.784	0.10	0.093		7	42	
Thorium 228	0.630	0.024	0.020			GAM	0.637	0.022	0.020		1	33	
Thorium 232	0.730	0.094	0.090			GAM	0.784	0.10	0.093		7	42	
Americium 241	U		0.070		U	GAM	U		0.025	U	-		
Jranium 238	U		2.0		U	GAM	U		2.6	U	-		
Jranium 235	U		0.10		U	GAM	U		0.064	U	-		

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DUPLICATES

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Version <u>3.06</u>
Report date <u>06/01/99</u>

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Date: 22 July 1999
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-BC Areas - Full Protocol - Waste Site 116-B-6B
Subject: Inorganics - Data Package No. H0393-RLN (SDG No. H0393)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0393-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
BOVDB2	4/27/99	Soil	C	See note 1
BOVDB3	4/27/99	Soil	C	See note 1
BOVD36	4/27/99	Soil	C	See note 1
BOVD37	4/27/99	Soil	C	See note 1
BOVD38	4/27/99	Soil	C	See note 1
BOVD39	4/27/99	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

000001

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 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 Blanks

One equipment blank (BOVDB2) was submitted for analysis. No analytes were detected in the equipment blank.

- **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 within QC limits, however, the laboratory used the field blank (BOVDB2) for the duplicate analysis.

Field Duplicates

One sample duplicate pair (BOVD38/BOVD39) was submitted for analysis. The samples were compared using the same criteria as for a laboratory duplicate. All field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial

000003

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 BOVDB2. 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. H0393-RLN (SDG No. H0393) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following had reported detection limits above their TDL: Chromium VI in all samples and lead in sample BOVDB2. 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).

Appendix 2

Summary of Data Qualification

000007

DATA QUALIFICATION SUMMARY

SDG: H0393	REVIEWER: TLI	DATE: 7/22/99	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

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 05/13/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L807

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
001	BOVD2	Chromium, Total	0.42 u	MG/KG	0.42	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.3 u	MG/KG	3.3	1.0
002	BOVD3	Chromium, Total	5.8	MG/KG	0.31	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.0	MG/KG	2.4	1.0
003	BOVD36	Chromium, Total	7.0	MG/KG	0.30	1.0
		Mercury, Total	0.04	MG/KG	0.02	1.0
		Lead, Total	5.5	MG/KG	2.3	1.0
004	BOVD37	Chromium, Total	9.5	MG/KG	0.41	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	7.9	MG/KG	3.2	1.0
005	BOVD38	Chromium, Total	6.5	MG/KG	0.40	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Lead, Total	5.3	MG/KG	3.1	1.0
006	BOVD39	Chromium, Total	7.2	MG/KG	0.37	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Lead, Total	5.3	MG/KG	2.9	1.0

pc
7/20/99

000011

005

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 05/05/99

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

RECRA LOT #: 9904L807

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOVDB2	% Solids Chromium VI	100 0.40 u	% MG/KG	0.01 0.40	1.0 1.0
-002	BOVDB3	% Solids Chromium VI	97.7 0.41 u	% MG/KG	0.01 0.41	1.0 1.0
-003	BOVD36	% Solids Chromium VI	96.1 0.42 u	% MG/KG	0.01 0.42	1.0 1.0
-004	BOVD37	% Solids Chromium VI	95.5 0.42 u	% MG/KG	0.01 0.42	1.0 1.0
-005	BOVD38	% Solids Chromium VI	94.6 0.42 u	% MG/KG	0.01 0.42	1.0 1.0
-006	BOVD39	% Solids Chromium VI	95.6 0.42 u	% MG/KG	0.01 0.42	1.0 1.0

RK
 7/20/99

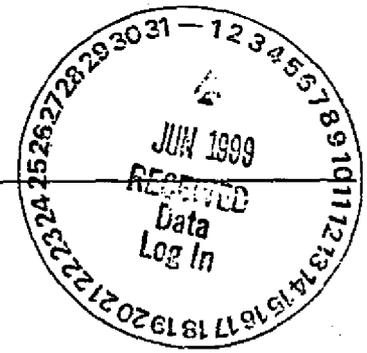
004

000012

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000013



**Recra LabNet Philadelphia
Analytical Report**

**Client : TNU-HANFORD B99-002
RFW# : 9904L807
SDG/SAF# : H0393/B99-002**

**W.O.# : 10985-001-001-9999-00
Date Received: 04-29-99**

METALS CASE NARRATIVE

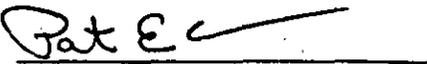
1. This narrative covers the analyses of 6 soil samples.
2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.
3. All analyses were performed within the required holding times.
4. The cooler temperature has been recorded on the Chain of Custody.
5. All 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. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

000014

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

001

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/m04-807

5-13-99
Date



000015

202



a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B99-002
RFW# : 9904L807
SDG# : H0393
SAF# : B99-002

W.O. # : 10985-001-001-9999-00
Date Received: 04-29-99

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 6 solid 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 Sample (LCS) for Soluble Chromium VI was within the laboratory control limits (LCL), however the Insoluble was above the LCL of 80-120%.
7. The matrix spike recoveries were above 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

July 21 1999
Date

njps04-507

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.

Collector Fahlberg/Kerkow	Company Contact R Coffman	Telephone No. 373-6425	Project Coordinator TRENT, SJ	Price Code copy	Date Turnaround 15 Days
Project Designation 100 BC Areas - Full Protocol	Sampling Location 100 B/C 116-B-6B	Field Logbook No. EL 1327-3	SAF No. B99-002	Method of Shipment Fed. Ex	
Ice Chest No. L0026	Offsite Property No. A990123	Bill of Lading/Air Bill No. 4257525290 R1686B2600		4/28/99 RJN	
Shipped To RECRA TSS. 4-27-99	COA Fed Ex R1686B2600				

807

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	Cool #C	None	None							
	Type of Container	P	uG	uG	uG	uG							
	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	ICP Metals - 6010A (SW-846) (Chromium, Lead); Mercury - 7471 - (CV)	See Item (7) in Special Instructions								
-----------------	---------------	--------------------------------------	---------------------	---	--------------------------------------	--	--	--	--	--	--	--	--

Sample No.	Matrix *	Sample Date	Sample Time										
BOVDB2	Soil	4-27-99	0830			X	X						
BOVDB3	Soil	4-27-99	1045			X	X						tie to B0104

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS				Matrix * Soil Water Vapor Other Solid Other Liquid
	Relinquished By K. Fahlberg	Date/Time 4-27-99	Received By R. Fahlberg	Date/Time 4-27-99	(1) Americium-241; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 - Total Sr; Nickel-63		
	Relinquished By R. Fahlberg	Date/Time 4/28/99	Received By R. Nielson	Date/Time 4/28/99	(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 4/28/99	Received By Fed Ex	Date/Time 4/28/99			
Relinquished By J. Fahlberg	Date/Time 4/29/99	Received By J. Fahlberg	Date/Time 4/29/99				
LABORATORY SECTION	Received By	Title				Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By				Date/Time	

Fahlberg/Kerkov	Company Contact R Coffman	Telephone No. 373-5425	Project Coordinator TRENT, SJ	Price Code copy	Date Turnaround 15 Day:
Project Designation 100 BC Areas - Full Protocol	Sampling Location 100 B/C 116-B-6B	SAF No. B99-002			
Ice Chest No. L0026	Field Logbook No. EL 1327-3	Method of Shipment Fed Ex			
Shipped To FMA/RECRA RF 4-27-99	Offsite Property No. A990123	Bill of Lading/Air Bill No. 423519525290			
			COA	R1bB6B2600	

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 - 7071 - (CV)	See Item (2) in Special Instructions					

Sample No.	Matrix *	Sample Date	Sample Time							
B0VD38	Soil	4-27-99	0930		X	X				tiets B0V013
B0VD37	Soil	4-27-99	1000		X	X				B0V016
B0VD38	Soil	4-27-99	1015		X	X				B0V017
B0VD39	Soil	4-27-99	1015		X	X				B0V018

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS			Matrix * Soil Water Vapor Other Solid Other Liquid
	Relinquished By <i>R. Fahlberg</i>	Date/Time 4/27/99 1620	Received By <i>R.F. 1-C</i>	Date/Time 4-27-99 1620	(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)	
	Relinquished By <i>Ref 1-C</i>	Date/Time 4/28/99 0930	Received By <i>R. Nelson</i>	Date/Time 4/28/99 0930		
	Relinquished By <i>R. Nelson</i>	Date/Time 4/28/99 0930	Received By <i>Fed Ex</i>	Date/Time		
	Relinquished By <i>Fed Ex</i>	Date/Time	Received By <i>J. J. J.</i>	Date/Time 4/29/99 0930		
Relinquished By <i>J. J. J.</i>	Date/Time	Received By	Date/Time			
LABORATORY SECTION	Received By	Title			Date/Time	
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By			Date/Time	

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	116-B-6B		DATA PACKAGE: H0393		
VALIDATOR:	TLI	LAB: Recra	DATE: 7/7/99		
CASE:			SDG: H0393		
ANALYSES PERFORMED					
<input type="checkbox"/> CLP/CP	<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/CP	<input type="checkbox"/> SW-846/GFAA	<input checked="" type="checkbox"/> SW-846/Hg	<input type="checkbox"/> SW-846 Cyanide	<input checked="" type="checkbox"/> CR VI	<input type="checkbox"/>
SAMPLES/MATRIX	BOVD B2	BOVD B3	BOVD 36	BOVD 37	
	BOVD 38	BOVD 39			
sil					

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: _____

A-1000020

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: level + CR VI over
BOUDBL EB

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: Lab used the EB as a duplicate

38 & 39 FD

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 III - all over Lead on B2

Reetra Lab/Mec - Elizaville

INORGANICS PRECISION REPORT 05/13/99

CLIENT: TRU-RANFORD 899-002
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 99041807

SAMPLE	SITE ID	ANALYTE	INITIAL		DILUTION
			RESULT	REPLICATE STD	
-001RP	BVDDB2	Chromium, Total	0.42u	0.42u	1.0
		Mercury, Total	0.02u	0.02u	1.0
		Lead, Total	3.3 u	3.3 u	1.0

9904023

008

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 05/13/99

CLIENT: TWO-RANFORD 899-002

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

RECRA LOT #: 9904L807

SAMPLE	SITE ID	ANALYTE	SPKED	INITIAL	SPKED	DILUTION
			SAMPLE	RESULT	AMOUNT	FACTOR(SPK)
-001	80VDB2	Chromium, Total	16.6	0.42u	18.3	90.7
		Mercury, Total	0.16	0.02u	0.16	102.5
		Lead, Total	40.2	3.3 u	45.9	87.6

000024

007

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/13/99

CLIENT: TWO-HAMPOND 899-002
WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9904L807

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK1	9910265-NM1	Chromium, Total	0.42	u	MG/KG	0.42
		Lead, Total	3.3	u	MG/KG	3.3
BLANK1	99C0123-NM1	Mercury, Total	0.02	u	MG/KG	0.02

000025

006

Recra LabNet - Lionville

INORGANICS PRECISION REPORT 05/05/99

CLIENT: TNU-HANFORD B99-002

RECRA LOT #: 9904L807

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION FACTOR (REP)
			RESULT	REPLICATE	RPD	
-001REP	BOVDB2	Chromium VI	0.40u	0.40u	NC	1.0
-006REP	BOVD39	% Solids	95.6	95.6	0.010	1.0

000026

008
~~007~~ 5/19

Recra LabNet - Lionville

INORGANICS ACCURACY REPORT 05/01/99

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

RECRA LOT #: 9904L807

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	BOVDB2	Soluble Chromium VI	3.7	0.40u	4.0	96.6	1.0
		Insoluble Chromium VI	1360	0.40u	1190	114.3	100
BLANK10	99LVIC17-MB1	Soluble Chromium VI	3.8	0.40u	4.0	96.0	1.0
		Insoluble Chromium VI	1550	0.40u	1210	128.0	100

000027

008

Recra LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 05/05/99

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

RECRA LOT #: 9904L807

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	99LV1037-MB1	Chromium VI	0.40 u	MG/KG	0.40	1.0

000028

~~003~~



SEP 01 '99 10:24AM BHT 509 372 944

		BFW/QA99011	
3. Project 116-B-6B		4. Page Page 1 of 1	

5. Document Number(s)/Title(s) H0393-TNU (SDO No. H0393)	6. Program/Project/ Building Number 100-BC Areas - Full Protocol - 116-B-6B	7. Reviewer Claude Stacey	8. Organization/Group BFW/QA	9. Location/Phone H0-16/372-9208
---	--	------------------------------	---------------------------------	-------------------------------------

17. Comment Submittal Approval:	18. Agreement with indicated comment disposition(s)	11. CLOSED
Organization Manager (Optional)	Date	Reviewer/Point of Contact Date
		9/1/99
		<i>C. Stacey</i> 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 ..."		correct 9/3/99 <i>rs</i>	
3				
4				

Post-it® Fax Note 7671		Date 9/1/99	# of pages 1
To Jeannette Durcan	From C. Stacey		
Co/Dept.	Co.		
Phone # 375-9439	Phone # 372-9208		
Fax # 372-9487	Fax #		

SEP 01 '99 10:34AM P. 1/13

Review Comment Record (RCR)	1. Date 8/04/99	2. Review No. BHI/QA99011
	3. Project 116-B-6B	4. Page Page 1 of 1

5. Document Number(s)/Title(s) H0393-TNU (SDG No. H0393)	6. Program/Project/ Building Number 100-BC Areas - Full Protocol - 116-B-6B	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) _____ Reviewer/Point of Contact _____ Reviewer/Point of Contact
 _____ Date _____ Date _____ Date
 _____ 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 ..."		correct 8/3/99 R	
3				
4				

AUG 31 1999 02:48PM BHI S&D MANAGEMENT 509 372 9487

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.

Duncan, Jeanette M

From: Routt, Tina/RLO [troutt@CH2M.com]
Sent: Tuesday, August 17, 1999 11:44 AM
To: Duncan, Jeanette/RLO-HAN
Subject: 116-B-6B (SDG No. H0393)

Jeanette -

In going through the inorganics validation package I did find an error. The validator states on page 4 that lead in sample B0VDB2 had an MDA greater than the TDL. In fact, lead has an MDA greater than TDL for all samples, not just B0VDB2.

- all but DB2 were ✓
detected

Also, the same comment Dave Blumenkranz had on H0399 (should be included in all data validation packages along with the issue of significant figures):

- corrected

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

- corrected

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

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
070	MEMORY TX		3755151	01/01	OK

ERRORS

- 1) HANG UP OR LINE FAIL 2) BUSY 3) NO ANSWER 4) NO FACSIMILE CONNECTION

1. Date 8/04/99		2. Review No. BHI/QA99011	
3. Project 116-B-6B		4. Page Page 1 of 1	
Reviewer Stacey	8. Organization/Group BHI/QA	9. Location/Phone HO-16/372-9208	
11. CLOSED			
15. Disposition (Provide justification if NOT accepted.)		16. Status	

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.

Duncan, Jeanette M

From: Routt, Tina/RLO [troutt@CH2M.com]
Sent: Tuesday, August 17, 1999 11:44 AM
To: Duncan, Jeanette/RLO-HAN
Subject: 116-B-6B (SDG No. H0393)

Jeanette -

In going through the inorganics validation package I did find an error. The validator states on page 4 that lead in sample B0VDB2 had an MDA greater than the TDL. In fact, lead has an MDA greater than TDL for all samples, not just B0VDB2.

Also, the same comment Dave Blumenkranz had on H0399 (should be included in all data validation packages along with the issue of significant figures):

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

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

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: 7 July 1999

Information Request

H0393 - Inorganics

Page 001, Inorganics Case Narrative states on line 5 that the method blank for "nitrate" was within criteria. I suspect that it should read "chromium VI".

Should Read cr VI

BTC

*is still open until we receive case narrative
(revised)*

→ narrative corrected



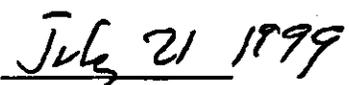
a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

**Recra LabNet Philadelphia
Analytical Report****Client :** TNU-HANFORD B99-002
RFW# : 9904L807
SDG# : H0393
SAF# : B99-002**W.O. # :** 10985-001-001-9999-00
Date Received: 04-29-99**INORGANIC CASE NARRATIVE**

1. This narrative covers the analyses of 6 solid 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 Sample (LCS) for Soluble Chromium VI was within the laboratory control limits (LCL), however the Insoluble was above the LCL of 80-120%.
7. The matrix spike recoveries were above 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

Date

njpl04-807

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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