Date: 3 April 2000
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-D Areas - Full Protocol - Waste Site 116-DR-4
Subject: Radiochemistry - Data Package No. H0726-TNU (SDG No. H0726)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0726-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
B0XD29	1/31/00	Soil	C	See note 1
B0XD30	1/31/00	Soil	C	See note 1
B0XD31	1/31/00	Soil	C	See note 1
B0XD32	1/31/00	Soil	C	See note 1
B0XD33	1/31/00	Soil	C	See note 1
B0XD34	1/31/00	Soil	C	See note 1

1 - Gamma spectroscopy; alpha spectroscopy (isotopic uranium and isotopic plutonium); total strontium.

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.

  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 TDL was exceeded for uranium-233(aspec), uranium-235(aspec), uranium-238(aspec) and uranium-238(gea).

  Equipment Blanks

  One equipment blank (B0XD31) was submitted for analysis. Uranium-233(aspec), uranium-238(aspec), potassium-40, radium-226, radium-228, thorium-228 and thorium-232 were detected in the equipment blank. All other equipment blank results were acceptable although the TDL was exceeded for uranium-235(aspec), europium-155, americium-241(gea) and uranium-238(gea).

- **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

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 then 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 although the equipment blank was used for the duplicate analysis.

Field Duplicate Sample

One sample duplicate pair (B0XD29/B0XD30) was submitted for analysis. The samples were compared using the same criteria as for a laboratory duplicate. All field duplicate results were acceptable.

- **Detection Levels**

Reported analytical detection levels for undetected analytes 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 following analytes were reported above their TDL: Uranium-235(aspec), uranium-238(gea) and europium-155 in all samples; uranium-235(gea) in samples B0XD29, B0XD30, B0XD33 and B0XD34; americium-241 in samples B0XD30, B0XD31, B0XD33 and B0XD34; europium-154 in samples B0XD29, B0XD30, B0XD33 and B0XD34; europium-152 in sample B0XD34; and cobalt-60 in sample B0XD34. Under the BHI statement of work, no qualifcation is required. All other reported laboratory MDAs were at or below the analyte-specific TDL or contract specified MDA.

- **Completeness**

  Data Package No. H0726 (SDG No. H0726) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The following analytes were reported above their TDL: Uranium-235(aspec), uranium-238(gea) and europium-155 in all samples; uranium-235(gea) in samples B0XD29, B0XD30, B0XD33 and B0XD34; americium-241 in samples B0XD30, B0XD31, B0XD33 and B0XD34; europium-154 in samples B0XD29, B0XD30, B0XD33 and B0XD34; europium-152 in sample B0XD34; and cobalt-60 in sample B0XD34.

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

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

DATA QUALIFICATION SUMMARY

SDG: H0726	REVIEWER: TLI	DATE: 4/3/00	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (PCi/G) Page__1 of__1

Project: BECHTEL-HANFORD																							
Laboratory: TNU																							
Case	SDG: H0726																						
Sample Number		B0XD29		B0XD30		B0XD31		B0XD32		B0XD33		B0XD34											
Location		A1		A1		A1		A2		A3		A4											
Remarks				Duplicate		E. Blank																	
Sample Date		1/31/00		1/31/00		1/31/00		1/31/00		1/31/00		1/31/00											
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q				
Uranium-233	0.1	0.272		0.395		0.354		0.648		0.403		0.422											
Uranium-235	0.1	0	U	0.048	U	0.043	U	0.046	U	0.049	U	0.026	U										
Uranium-238	0.1	0.425		0.257		0.371		0.498		0.322		0.465											
Plutonium-238	0.1	0	U	0.004	U	0.011	U	0	U	-0.004	U	0.022	U										
Plutonium-239/40	0.1	0.007	U	0.008	U	0	U	0	U	-0.004	U	-0.004	U										
Strontium (total)	1	0.001	U	-0.079	U	-0.020	U	0.005	U	-0.067	U	0.167	U										
Potassium-40		12.4		11.8		3.34		12.8		13.7		12.8											
Cobalt 60	0.05	U	U	U	U	U	U	U	U	U	U	U	U										
Cesium 137	0.05	0.058		0.047		U	U	0.061		U	U	0.047											
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		0.466		0.539		0.234		0.517		0.522		0.494											
Radium-228		0.823		0.832		0.302		0.786		0.773		0.796											
Thorium-228		0.711		0.694		0.257		0.659		0.735		0.644											
Thorium-232		0.823		0.832		0.302		0.786		0.773		0.796											
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 H0726

R002013-01 B0XD29

DATA SHEET

SDG	7343	Client/Case no	Hanford SDG H0726
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	R002013-01	Client sample id	B0XD29
Dept sample id	7343-001	Location/Matrix	116-D-4 SOLID
Received	02/02/00	Collected	01/31/00 10:00
% solids	90.5	Custody/SAF No	B99-005-087 B99-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233	U-233/234	0.272	0.14	0.13	1.0	~~J~~	U
Uranium 235	15117-96-1	0	0.041	0.16	1.0	U	U
Uranium 238	U-238	0.425	0.17	0.13	1.0	~~J~~	U
Plutonium 238	13981-16-3	0	0.037	0.068	1.0	U	PU
Plutonium 239/240	PU-239/240	0.007	0.015	0.035	1.0	U	PU
Total Strontium	SR-RAD	0.001	0.13	0.18	1.0	U	SR
Potassium 40	13966-00-2	12.4	0.95	0.53			GAM
Cobalt 60	10198-40-0	U		0.043	0.050	U	GAM
Cesium 137	10045-97-3	0.058	0.047	0.049	0.10	~~J~~	GAM
Europium 152	14683-23-9	U		0.096	0.10	U	GAM
Europium 154	15585-10-1	U		0.15	0.10	U	GAM
Europium 155	14391-16-3	U		0.084	0.10	U	GAM
Radium 226	13982-63-3	0.466	0.081	0.082	0.10		GAM
Radium 228	15262-20-1	0.823	0.18	0.16	0.20		GAM
Thorium 228	14274-82-9	0.711	0.052	0.050			GAM
Thorium 232	TH-232	0.823	0.18	0.16			GAM
Americium 241	14596-10-2	U		0.057		U	GAM
Uranium 238	U-238	U		5.4		U	GAM
Uranium 235	15117-96-1	U		0.12		U	GAM

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SAMPLE DELIVERY GROUP H0726

R002013-02 B0XD30

DATA SHEET

SDG 7343	Client/Case no Hanford	SDG H0726	
Contact Melissa C. Mannion	Contract TRB-SBB-207925		
Lab sample id R002013-02	Client sample id B0XD30		
Dept sample id 7343-002	Location/Matrix 116-D-4	SOLID	
Received 02/02/00	Collected 01/31/00 10:00		
% solids 91.7	Custody/SAF No B99-005-087	B99-005	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233	U-233/234	0.395	0.20	0.15	1.0		U
Uranium 235	15117-96-1	0.048	0.048	0.18	1.0	U	U
Uranium 238	U-238	0.257	0.16	0.15	1.0		U
Plutonium 238	13981-16-3	0.004	0.016	0.037	1.0	U	PU
Plutonium 239/240	PU-239/240	0.008	0.016	0.037	1.0	U	PU
Total Strontium	SR-RAD	-0.079	0.12	0.17	1.0	U	SR
Potassium 40	13966-00-2	11.8	0.79	0.42			GAM
Cobalt 60	10198-40-0	U		0.040	0.050	U	GAM
Cesium 137	10045-97-3	0.047	0.034	0.042	0.10		GAM
Europium 152	14683-23-9	U		0.098	0.10	U	GAM
Europium 154	15585-10-1	U		0.12	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Radium 226	13982-63-3	0.539	0.074	0.070	0.10		GAM
Radium 228	15262-20-1	0.832	0.16	0.17	0.20		GAM
Thorium 228	14274-82-9	0.694	0.045	0.043			GAM
Thorium 232	TH-232	0.832	0.16	0.17			GAM
Americium 241	14596-10-2	U		0.14		U	GAM
Uranium 238	U-238	U		4.6		U	GAM
Uranium 235	15117-96-1	U		0.14		U	GAM

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SAMPLE DELIVERY GROUP H0726

R002013-03 B0XD31

DATA SHEET

SDG 7343	Client/Case no Hanford	SDG H0726	
Contact Melissa C. Mannion	Contract TRB-SBB-207925		
Lab sample id R002013-03	Client sample id B0XD31		
Dept sample id 7343-003	Location/Matrix 116-D-4	SOLID	
Received 02/02/00	Collected 01/31/00 10:00		
% solids 100.0	Custody/SAF No B99-005-087	B99-005	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233	U-233/234	0.354	0.18	0.14	1.0	~~U~~	U
Uranium 235	15117-96-1	0.043	0.043	0.16	1.0	U	U
Uranium 238	U-238	0.371	0.18	0.14	1.0	~~U~~	U
Plutonium 238	13981-16-3	0.011	0.054	0.10	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.032	0.066	1.0	U	PU
Total Strontium	SR-RAD	-0.020	0.14	0.19	1.0	U	SR
Potassium 40	13966-00-2	3.34	0.36	0.19			GAM
Cobalt 60	10198-40-0	U		0.020	0.050	U	GAM
Cesium 137	10045-97-3	U		0.019	0.10	U	GAM
Europium 152	14683-23-9	U		0.050	0.10	U	GAM
Europium 154	15585-10-1	U		0.064	0.10	U	GAM
Europium 155	14391-16-3	U		0.069	0.10	U	GAM
Radium 226	13982-63-3	0.234	0.036	0.032	0.10		GAM
Radium 228	15262-20-1	0.302	0.072	0.068	0.20		GAM
Thorium 228	14274-82-9	0.257	0.025	0.026			GAM
Thorium 232	TH-232	0.302	0.072	0.068			GAM
Americium 241	14596-10-2	U		0.18		U	GAM
Uranium 238	U-238	U		2.3		U	GAM
Uranium 235	15117-96-1	U		0.085		U	GAM

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SAMPLE DELIVERY GROUP H0726

R002013-04 B0XD32

DATA SHEET

SDG	7343	Client/Case no	Hanford SDG H0726
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	R002013-04	Client sample id	B0XD32
Dept sample id	7343-004	Location/Matrix	116-D-4 SOLID
Received	02/02/00	Collected	01/31/00 10:10
% solids	93.3	Custody/SAF No	B99-005-087 B99-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233	U-233/234	0.648	0.24	0.15	1.0	J	U
Uranium 235	15117-96-1	0.046	0.046	0.18	1.0	U	U
Uranium 238	U-238	0.496	0.20	0.15	1.0	J	U
Plutonium 238	13981-16-3	0	0.009	0.036	1.0	U	PU
Plutonium 239/240	PU-239/240	0	0.009	0.036	1.0	U	PU
Total Strontium	SR-RAD	0.005	0.14	0.19	1.0	U	SR
Potassium 40	13966-00-2	12.8	0.76	0.30			GAM
Cobalt 60	10198-40-0	U		0.025	0.050	U	GAM
Cesium 137	10045-97-3	0.061	0.027	0.031	0.10	J	GAM
Europium 152	14683-23-9	U		0.064	0.10	U	GAM
Europium 154	15585-10-1	U		0.086	0.10	U	GAM
Europium 155	14391-16-3	U		0.064	0.10	U	GAM
Radium 226	13982-63-3	0.517	0.055	0.051	0.10		GAM
Radium 228	15262-20-1	0.786	0.12	0.11	0.20		GAM
Thorium 228	14274-82-9	0.659	0.031	0.029			GAM
Thorium 232	TH-232	0.786	0.12	0.11			GAM
Americium 241	14596-10-2	U		0.034		U	GAM
Uranium 238	U-238	U		3.0		U	GAM
Uranium 235	15117-96-1	U		0.10		U	GAM

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SAMPLE DELIVERY GROUP H0726

R002013-05 B0XD33

DATA SHEET

SDG	7343	Client/Case no	Hanford SDG H0726
Contact	Melissa C. Mannion	Contract	TRB-SBB-207925
Lab sample id	R002013-05	Client sample id	B0XD33
Dept sample id	7343-005	Location/Matrix	116-D-4 SOLID
Received	02/02/00	Collected	01/31/00 10:20
% solids	91.6	Custody/SAF No	B99-005-087 B99-005

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALIFIERS	TEST
Uranium 233	U-233/234	0.403	0.17	0.15	1.0	J	U
Uranium 235	15117-96-1	0.049	0.049	0.19	1.0	U	U
Uranium 238	U-238	0.322	0.16	0.15	1.0	J	U
Plutonium 238	13981-16-3	-0.004	0.007	0.027	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.004	0.014	0.034	1.0	U	PU
Total Strontium	SR-RAD	-0.067	0.12	0.18	1.0	U	SR
Potassium 40	13966-00-2	13.7	0.84	0.38			GAM
Cobalt 60	10198-40-0	U		0.038	0.050	U	GAM
Cesium 137	10045-97-3	U		0.035	0.10	U	GAM
Europium 152	14683-23-9	U		0.086	0.10	U	GAM
Europium 154	15585-10-1	U		0.14	0.10	U	GAM
Europium 155	14391-16-3	U		0.14	0.10	U	GAM
Radium 226	13982-63-3	0.522	0.072	0.066	0.10		GAM
Radium 228	15262-20-1	0.773	0.17	0.16	0.20		GAM
Thorium 228	14274-82-9	0.735	0.052	0.053			GAM
Thorium 232	TH-232	0.773	0.17	0.16			GAM
Americium 241	14596-10-2	U		0.34		U	GAM
Uranium 238	U-238	U		5.2		U	GAM
Uranium 235	15117-96-1	U		0.17		U	GAM

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SAMPLE DELIVERY GROUP H0726

R002013-06 B0XD34

DATA SHEET

SDG 7343	Client/Case no Hanford	SDG H0726	
Contact Melissa C. Mannion	Contract TRB-SBB-207925		
Lab sample id R002013-06	Client sample id B0XD34		
Dept sample id 7343-006	Location/Matrix 116-D-4	SOLID	
Received 02/02/00	Collected 01/31/00 10:30		
% solids 93.6	Custody/SAF No B99-005-087	B99-005	

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Uranium 233	U-233/234	0.422	0.21	0.16	1.0		U
Uranium 235	15117-96-1	0.026	0.051	0.20	1.0	U	U
Uranium 238	U-238	0.465	0.22	0.16	1.0		U
Plutonium 238	13981-16-3	0.022	0.022	0.028	1.0	U	PU
Plutonium 239/240	PU-239/240	-0.004	0.015	0.035	1.0	U	PU
Total Strontium	SR-RAD	0.167	0.13	0.17	1.0	U	SR
Potassium 40	13966-00-2	12.8	1.0	0.42			GAM
Cobalt 60	10198-40-0	U		0.051	0.050	U	GAM
Cesium 137	10045-97-3	0.047	0.038	0.046	0.10		GAM
Europium 152	14683-23-9	U		0.11	0.10	U	GAM
Europium 154	15585-10-1	U		0.16	0.10	U	GAM
Europium 155	14391-16-3	U		0.12	0.10	U	GAM
Radium 226	13982-63-3	0.494	0.092	0.097	0.10		GAM
Radium 228	15262-20-1	0.796	0.20	0.21	0.20		GAM
Thorium 228	14274-82-9	0.644	0.056	0.057			GAM
Thorium 232	TH-232	0.796	0.20	0.21			GAM
Americium 241	14596-10-2	U		0.17		U	GAM
Uranium 238	U-238	U		5.6		U	GAM
Uranium 235	15117-96-1	U		0.18		U	GAM

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

1.0 GENERAL

Bechtel Hanford Inc. (BHI) Sample Delivery Group H0726 was composed of six solid (soil) samples designated under SAF No. B99-005 with a Project Designation of: 100 D Areas – Full Protocol.

The samples were received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Thermo Retec Sample Receipt Checklist. Results were transmitted to BHI via facsimile on February 16, 2000.

2.0 ANALYSIS NOTES

2.1 Total Strontium Analyses

No problems were encountered during the course of the analyses.

2.2 Isotopic Uranium Analyses

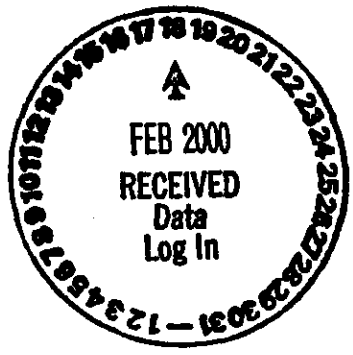
No problems were encountered during the course of the analyses.

2.3 Isotopic Plutonium Analyses

No problems were encountered during the course of the analyses.

2.4 Gamma Spec Analyses

No problems were encountered during the course of the analyses.



Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-005-087	Page 1 of 2

Collector ~~Kerkow/Fries~~ DBchake W. Cowsell DBR 1-31-00	Company Contact RB Kerkow; Telephone No. 531-0635	Project Coordinator TRENT, SJ	Price Code 8K; Data Turnaround 15 Days
Project Designation 100 D Areas - Full Protocol	Sampling Location 116-DR-4 H0726 (7343)	SAF No. B99-005	Air Quality ☐
Ice Chest No. ERC 99 020	Field Logbook No. EL-1339-6; COA R16DR4 2600	Method of Shipment FedEx RAD H0726	
Shipped To ~~TMA/REGRA~~	Offsite Property No. A000099	Bill of Lading/Air Bill No. 4235 7953 3678	

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially Radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C
Type of Container	P	aG
No. of Container(s)	1	1
Volume	1L	60mL

000019

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	Chromium Hex - 7196
B0XD29	Soil	1-31-00	1000	X	
B0XD30	Soil	1-31-00	1000	X	
B0XD31	Soil	1-31-00	1000	X	
B0XD32	Soil	1-31-00	1010	X	
B0XD33	Soil	1-31-00	1020	X	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
D B Bchake DBR	1-31-00 1630	Ref 3C	
REF 3C 2100	1000	SJGALE 2100	1000
SJGALE 2100	1000	FED EX	2-1-00
Fed Ex	2-2-00 9:15	R Corso	2-2-00 9:15

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr

FAXED 2/2/00

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-005-087	Page 2 of 2
Collector ~~Kerkow/Price~~ DBohnke / JCowgill DOB 1-31-00	Company Contact RB Kerkow / Telephone No. 531-0635	Project Coordinator TRENT, SJ	Price Code 8K / Data Turnaround 15 Days
Project Designation 100 D Areas - Full Protocol	Sampling Location 116-DR-4 H0726 (7343)	SAF No. B99-005	Air Quality ☐
Ice Chest No. GRC 99 020	Field Logbook No. EL-1339-6 / COA R16DR42600	Method of Shipment FedEx RAD H0726	
Shipped To TMA/~~RECRA~~	Offsite Property No. A00099	Bill of Lading/Air Bill No. 423579533678	

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially Radioactive

Special Handling and/or Storage

Preservation	None	Cool 4C									
Type of Container	P	G									
No. of Container(s)	1	1									
Volume	1L	60mL									

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	See item (1) in Special Instructions.	Chromium Hex - 7196
B0XD34	Soil	1-31-00	1030	X	DBB 1-31-00

CHAIN OF POSSESSION

Sign/Print Names			
Relinquished By DBohnke / DB Bell	Date/Time 1-31-00 1630	Received By Ref 3C	Date/Time
Relinquished By REF 3C 2100	Date/Time 1000	Received By SJGALE 2100	Date/Time 1000
Relinquished By SJGALE 2100	Date/Time 1000	Received By FED EX	Date/Time 2-1-00
Relinquished By Fed Ex	Date/Time 2-2-00 9:15	Received By [illegible]	Date/Time 9:15
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 – Total Sr

FAXED 2/2/00

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

3HI-EE-011 (10/99)

Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100 D 116-DR-4			DATA PACKAGE: H0726		
VALIDATOR: TLI		LAB: TMU		DATE: 3/28/00	
CASE:			SDG: H0726		

ANALYSES PERFORMED

☐ Gross Alpha/Beta	☒ Strontium-90	☐ Technetium-99	☒ Alpha Spectroscopy	☒ Gamma Spectroscopy	
☐ Total Uranium	☐ Radium-22	☐ Tritium	☐		

SAMPLES/MATRIX B0XD29 B0XD30 B0XD31
B0XD32 B0XD33 B0XD34

Soil

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: MB Ur all anal +DL U238 anal +DL

FB U233 U238(cspec) K40 RA 226/228 th 228/232
U238(spec) 155 Am241 - anal +DL

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:_____

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: Used ED

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: 29/30

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: 233 Aspec all 155- all U238(gea) all
C060 - 34 152 - 34 154 - 29/30/33/34 Am241 - 30/31/33/34
U233(gea) 29/30/33/34

All

HO726

RLW

No additional comments for this SDG

RLW 4-6-00

Data validation results:			
Validator:	DWS		
Date:	4/4/00		
SDGs:	SAF	COA	Project:
HO-726	B00-005	R116D4 2Y20	116-D-4 French drain
~~W03091~~	~~B00-044~~	~~R105F2 2F00~~	~~105-F/DR phase III below grade areas sampling and analysis~~
data package	**analysis**	**page**	**comment**
HO726	Rad chem	3	Under detection levels: the seventh line should be changed to reflect that B0XD34 failed to meet the U235(gea) not B0XD32 as stated. — correct ✓
~~HO726~~	Rad chem	multiple	The data summary package, and all paperwork from the laboratory state total Sr, whereas the chains and the DOE/RL-96-22 table II-2 list Sr90, the chains further specify Sr89 and also Sr total. If total radiogenic Sr is being requested why does the paperwork not consistantly state this? This observation has been made previously, request clarification. RLW 4-6-00
HO726	Rad chem	4	under minor deficiencies: the third line should be changed to reflect that B0XD34 failed to meet the U235(gea) not B0XD32 as stated. — correct ✓
~~HO726~~	Cr+6	15?	the package submitted to the Chl validator lacked a chain of custody for samples B0XD29 through B0XD33 — cant ✓
~~W03091~~	Rad Chem	multiple	Similar observation with regards to Sr verses Sr-90. The data summary package states both Sr total and "strontium", the lab paperwork specifies Sr total, whereas the chains and the DOE/RL-99-35 table 2-2 list Sr90, the chains further specify Sr89 and also Sr total. If total radiogenic Sr is being requested why does the paperwork not consistantly state this? This observation has been made perviously, request clarification.
~~W03091~~	ICP "supertrace"		no errors found

Date: 3 April 2000
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 100-D Areas - Full Protocol - Waste Site 116-DR-4
Subject: Inorganics - Data Package No. H0726-RLN (SDG No. H0726)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0726-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
B0XD29	1/31/00	Soil	C	Chromium VI by 7196A
B0XD30	1/31/00	Soil	C	Chromium VI by 7196A
B0XD31	1/31/00	Soil	C	Chromium VI by 7196A
B0XD32	1/31/00	Soil	C	Chromium VI by 7196A
B0XD33	1/31/00	Soil	C	Chromium VI by 7196A
B0XD34	1/31/00	Soil	C	Chromium VI by 7196A

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 30 days for chromium VI.

  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 TDL was exceeded.

Equipment Blanks

One equipment blank (B0XD31) was submitted for analysis. All equipment blank results were acceptable although the TDL was exceeded.

- **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 Duplicate

  One sample duplicate pair (B0XD29/B0XD30) were 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 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 TDL was exceeded for all samples. Under the BHI statement of work, no qualification is required.

- **Completeness**

Data package No. H0726-RLN (SDG No. H0726) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The TDL was exceeded for 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

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

DATA QUALIFICATION SUMMARY

SDG: H0726	REVIEWER: TLI	DATE: 4/3/00	PAGE 1 OF 1
COMMENTS: No qualifiers assigned.			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																					
Laboratory: RECRA LabNet																					
Case	SDG: H0726																				
Sample Number		B0XD29		B0XD30		B0XD31		B0XD32		B0XD33		B0XD34									
Location		A1		A1		A1		A2		A3		A4									
Remarks				Duplicate		E. Blank															
Sample Date		1/31/00		1/31/00		1/31/00		1/31/00		1/31/00		1/31/00									
Inorganics	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chromium VI	0.1	0.45	U	0.44	U	0.40	U	0.43	U	0.42	U	0.43	U								

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 02/10/00

CLIENT: TNU-HANFORD B99-005 RECRA LOT #: 0002L347
WORK ORDER: 10985-001-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B0XD29	% Solids	89.7	%	0.01	1.0
		Chromium VI	0.45 u	MG/KG	0.45	1.0
-002	B0XD30	% Solids	91.6	%	0.01	1.0
		Chromium VI	0.44 u	MG/KG	0.44	1.0
-003	B0XD31	% Solids	100	%	0.01	1.0
		Chromium VI	0.40 u	MG/KG	0.40	1.0
-004	B0XD32	% Solids	93.3	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0
-005	B0XD33	% Solids	95.1	%	0.01	1.0
		Chromium VI	0.42 u	MG/KG	0.42	1.0
-006	B0XD34	% Solids	93.4	%	0.01	1.0
		Chromium VI	0.43 u	MG/KG	0.43	1.0

4/3/00

DAT4

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

RECRA ENVIRONMENTAL INC.
Chemical and Environmental Measurement Information

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD B99-005
RFW# : 0002L347
SDG# : H0726
SAF# : B99-005

W.O. # : 10985-001-001-9999-00
Date Received: 02-02-00

INORGANIC CASE NARRATIVE

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

Pat E

J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

2-28-00
Date

njp\l02-347

208 Welsh Pool Road • Lionville, PA 19341-1333 • (610) 280-3000 • Fax (610) 280-3041

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B99-005-087	Page 2 of 2
Collector ~~Kerkow/Fries~~ D Behnke / d Cargill DBB 1-31-00	Company Contact RB Kerkow; Telephone No. 531-0635	Project Coordinator TRENT, SJ	Price Code 8K; Data Turnaround 15 Days
Project Designation 100 D Areas - Full Protocol	Sampling Location 116-DR-4	SAF No. B99-005	Air Quality ☐
Ice Chest No. ERC 96 068	Field Logbook No. EL-1339-6; COA R16DR42600	Method of Shipment FedEx	
Shipped To ~~TMA~~/RECRA	Offsite Property No. A00 0105	Bill of Lading/Air Bill No. 4235 7953 3689	

POSSIBLE SAMPLE HAZARDS/REMARKS
Potentially Radioactive

Special Handling and/or Storage

Preservation				None	Cool 4C							
Type of Container				P	aG							
No. of Container(s)				1	1							
Volume				1L	60mL							
SAMPLE ANALYSIS				See item (1) in Special Instructions.	Chromium Hex - 7196							
Sample No.	Matrix *	Sample Date	Sample Time									
B0XD34	Soil	1-31-00	1030	DBB 1-31-00	X							

000044

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
D B Behnke DBB	1-31-00 1630	Ref 3C	
REF 3C	2100/1000	SJGALE	2100/1000
SJGALE	2100/1000	FED EX	
Fed Ex	2.2.00 / 0940	D Smith	2.2.00 / 0940

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr

0002L347 — temp. 3.5°

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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

BHI-EE-011 (10/99)

Bechtel Hanford Inc. — CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B99-005-087 | Page 1 of 2

Collector ~~Kerkow/Price~~ DBehnk, LdCardgill DBB 1-31-00	**Company Contact** RB Kerkow	**Telephone No.** 531-0635	**Project Coordinator** TRENT, SJ
Price Code 8K	**Data Turnaround** 15 Days	**Air Quality** ☐	
Project Designation 100 D Areas - Full Protocol	**Sampling Location** 116-DR-4		**SAF No.** B99-005
Ice Chest No. ERC 96 068	**Field Logbook No.** EL-1339-6	**COA** R16DR42600	**Method of Shipment** FedEx
Shipped To ~~TMA~~/RECRA	**Offsite Property No.** A ØØ 01Ø5		**Bill of Lading/Air Bill No.** 4235 7953 3689

POSSIBLE SAMPLE HAZARDS/REMARKS

Potentially Radioactive

Special Handling and/or Storage

000015

Preservation	None	Cool 4C
Type of Container	P	aG
No. of Container(s)	1	1
Volume	1L	60mL
SAMPLE ANALYSIS	See item (1) in Special Instructions.	Chromium Hex - 7196

Sample No.	Matrix *	Sample Date	Sample Time	See item (1)	Chromium Hex - 7196
B0XD29	Soil	1-31-00	1000	X	X
B0XD30	Soil	1-31-00	1000		X
B0XD31	Soil	1-31-00	1000		X
B0XD32	Soil	1-31-00	1010		X
B0XD33	Soil	1-31-00	1020		X

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
D Behnk	1-31-00 1630	Ref 3C	
REF 3 C	2100/1000	SJGALE	2100/1000
SJGALE	2100/1000	FED EX	
Fed Ex	2-2-00/0940	[illegible]	2-2-00/0940

SPECIAL INSTRUCTIONS

(1) Gamma Spectroscopy {Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155}; Isotopic Plutonium; Isotopic Uranium; Strontium-89,90 -- Total Sr

0002L347 - temp. 3.5°

Matrix *
S=Soil
SE=Sediment
SO=Solid
S=Sludge
W=Water
O=Oil
A=Air
DS=Drum Solids
DL=Drum Liquids
T=Tissue
WI=Wipe
L=Liquid
V=Vegetation
X=Other

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: 100 Areas		116-DR-4	DATA PACKAGE: H0726		
VALIDATOR: TLI		LAB: ~~TAS~~ PACRA		DATE: 3/28/00	
CASE:			SDG: H0726		

ANALYSES PERFORMED					
☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	~~☐~~ CrVI	☐

SAMPLES/MATRIX					
	B0XD29	B0XD30	B0XD31		
	B0XD32	B0XD33	B0XD34		
					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: _____

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: eb – over +DL MB over +DL

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:

A-20

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:_____

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: all over TDL

HO726

RLW

No additional comments for this SDG

RLW 4-6-00

Data validation results:			
Validator:	DWS		
Date:	4/4/00		
SDGs:	SAF	COA	Project:
HO-726	B00-005	R116D4 2Y20	116-D-4 French drain
~~W03091~~	~~B00-014~~	~~R105F2 2F80~~	~~105-F/DR phase III below grade areas sampling and analysis~~
data package	**analysis**	**page**	**comment**
HO726	Rad chem	3	Under detection levels: the seventh line should be changed to reflect that B0XD34 failed to meet the U235(gea) not B0XD32 as stated. — correct ✓
~~HO726~~	Rad chem	multiple	The data summary package, and all paperwork from the laboratory state total Sr, whereas the chains and the DOE/RL-96-22 table II-2 list Sr90, the chains further specify Sr89 and also Sr total. If total radiogenic Sr is being requested why does the paperwork not consistently state this? This observation has been made previously, request clarification. RLW 4-6-00
HO726	Rad chem	4	under minor deficiencies: the third line should be changed to reflect that B0XD34 failed to meet the U235(gea) not B0XD32 as stated. — correct ✓
HO726	Cr+6	15?	the package submitted to the ChL validator lacked a chain of custody for samples B0XD29 through B0XD33
~~W03091~~	Rad Chem	multiple	Similar observation with regards to Sr verses Sr-90. The data summary package states both Sr total and "strontium", the lab paperwork specifies Sr total, whereas the chains and the DOE/RL-99-35 table 2-2 list Sr90, the chains further specify Sr89 and also Sr total. If total radiogenic Sr is being requested why does the paperwork not consistently state this? This observation has been made perviously, request clarification.
~~W03091~~	ICP "supertrace"		no errors found

Review Comment Record (RCR)

1. Date	2. Review No.
4/10/00	BHI/QA0024
3. Project	4. Page
100-D	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
SDG No. H0726	100-D Areas – Full Protocol – 116-DR-4	Claude Stacey	BHI/QA	H0-16/372-9208

17. Comment Submittal Approval:

Organization Manager (Optional) _____ Date _____

10. Agreement with indicated comment disposition(s)

Reviewer/Point of Contact _____ Date _____

Author/Originator _____

11. CLOSED

Reviewer/Point of Contact _____ Date _____

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	Radiochemistry: OK – No Comments			
2	Inorganics: OK No Comments			
3				

Duncan, Jeanette M

From: Routt, Tina/RLO [troutt@ch2m.com]
Sent: Tuesday, April 04, 2000 3:09 PM
To: Duncan, Jeanette/RLO-HAN
Subject: Validation Review SDG H07026

Jeanette -

I've reviewed the validation for 116-DR-4. No changes.

Tina Routt
CH2M Hill Richland Office
troutt@ch2m.com
(509) 375-3444, ext. 211
(509) 375-5566 fax

Review Comment Record (RCR)

1. Date	2. Review No.
4/10/00	BHI/QA0024
3. Project	4. Page
100-D	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
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RLW 4-6-00

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Sent: Tuesday, April 04, 2000 3:09 PM
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Tina Routt
CH2M Hill Richland Office
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(509) 375-3444, ext. 211
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W03091	ICP "supertrace"		no errors found

Duncan, Jeanette M

From: Shea, David W
Sent: Tuesday, April 04, 2000 11:30 AM
To: Weiss, Richard L; Duncan, Jeanette M
Subject: Data packages H0-726 and W03091

Jeanette and Rich,

The validation of the above mentioned data packages is complete. The observations are attached as an excel spreadsheet. The paper copies of the data packages have been recycled.

Dave

dataval4.xls