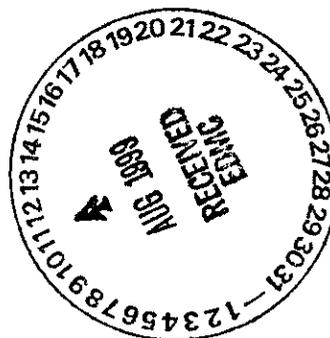


SDG NUM	SAMP NUM	CON ID	CON LONG N	METHOD NAME	VALUE RPTD	LAB	VALIDATION QU
H0195	B0PK27	7439-97-6	Mercury	7470_HG_CVAA	0.25		
H0195	B0PK26	7439-97-6	Mercury	7470_HG_CVAA	0.36		
H0195	B0PK22	7439-97-6	Mercury	7470_HG_CVAA	0.02	U	
H0195	B0PK24	7439-97-6	Mercury	7470_HG_CVAA	0.3		
H0195	B0PK20	7439-97-6	Mercury	7470_HG_CVAA	0.24		J
H0195	B0PK19	7439-97-6	Mercury	7470_HG_CVAA	0.23		J
H0195	B0PK17	7439-97-6	Mercury	7470_HG_CVAA	0.38		J
H0195	B0PK18	7439-97-6	Mercury	7470_HG_CVAA	0.19		J
H0195	B0PK21	7439-97-6	Mercury	7470_HG_CVAA	0.22		
H0195	B0PK23	7439-97-6	Mercury	7470_HG_CVAA	2.4		
H0195	B0PK25	7439-97-6	Mercury	7470_HG_CVAA	1.8		

Validation qualifiers entered into H&L

4-12-99

RZW



SDG_NUM	SAMP_NUM	CON_ID	METHOD_NAME	VALUE_RPTD	LAB_QUALIFIER	VALIDA
H0195	B0PK17	13981-37-8	NI63_LSC	480		J
H0195	B0PK18	13981-37-8	NI63_LSC	170		J
H0195	B0PK19	13981-37-8	NI63_LSC	160		J
H0195	B0PK20	13981-37-8	NI63_LSC	140		J
H0195	B0PK21	13981-37-8	NI63_LSC	180		J
H0195	B0PK22	13981-37-8	NI63_LSC	2.2 U		J
H0195	B0PK23	13981-37-8	NI63_LSC	1300		J
H0195	B0PK24	13981-37-8	NI63_LSC	110		J
H0195	B0PK25	13981-37-8	NI63_LSC	380		J
H0195	B0PK26	13981-37-8	NI63_LSC	140		J
H0195	B0PK27	13981-37-8	NI63_LSC	73		J

*Validation qualifiers entered into
HELS - 4-12-99*

RAW

SDG NUM	SAMP NUM	CON ID	CON LONG N	METHOD NAME	VALUE RPTD	LAB	VALIDA
H0195	B0PK27	7440-47-3	Chromium	6010_METALS_ICP	142		
H0195	B0PK26	7439-92-1	Lead	6010_METALS_ICP	3.9		
H0195	B0PK26	7440-47-3	Chromium	6010_METALS_ICP	117		
H0195	B0PK25	7439-92-1	Lead	6010_METALS_ICP	7.7		
H0195	B0PK25	7440-47-3	Chromium	6010_METALS_ICP	117		
H0195	B0PK24	7439-92-1	Lead	6010_METALS_ICP	4.4		
H0195	B0PK17	7439-92-1	Lead	6010_METALS_ICP	8		
H0195	B0PK20	7440-47-3	Chromium	6010_METALS_ICP	152		J
H0195	B0PK19	7439-92-1	Lead	6010_METALS_ICP	10.3		
H0195	B0PK19	7440-47-3	Chromium	6010_METALS_ICP	153		J
H0195	B0PK17	7440-47-3	Chromium	6010_METALS_ICP	226		J
H0195	B0PK18	7439-92-1	Lead	6010_METALS_ICP	6.2		
H0195	B0PK18	7440-47-3	Chromium	6010_METALS_ICP	90.9		J
H0195	B0PK20	7439-92-1	Lead	6010_METALS_ICP	4.9		
H0195	B0PK22	7440-47-3	Chromium	6010_METALS_ICP	0.17		U
H0195	B0PK21	7439-92-1	Lead	6010_METALS_ICP	4.3		
H0195	B0PK21	7440-47-3	Chromium	6010_METALS_ICP	131		
H0195	B0PK24	7440-47-3	Chromium	6010_METALS_ICP	144		
H0195	B0PK23	7439-92-1	Lead	6010_METALS_ICP	7.8		
H0195	B0PK23	7440-47-3	Chromium	6010_METALS_ICP	339		
H0195	B0PK22	7439-92-1	Lead	6010_METALS_ICP	1.2		
H0195	B0PK27	7439-92-1	Lead	6010_METALS_ICP	4.1		

Validation qualifiers entered into HERS
4-12-99 RLW

SAMP_NUM	ANAL_MTHD_ID	CON_ID	CON_LONG_N	VALUE_RPTD	QUALI	VALIDATION_QU
BOPK16	7471_HG_CV	7439-97-6	Mercury	0.59	N	
BOPK17	7470_HG_CV	7439-97-6	Mercury	0.38		J
BOPK18	7470_HG_CV	7439-97-6	Mercury	0.19		J
BOPK19	7470_HG_CV	7439-97-6	Mercury	0.23		J
BOPK20	7470_HG_CV	7439-97-6	Mercury	0.24		J
BOPK21	7470_HG_CV	7439-97-6	Mercury	0.22		
BOPK22	7470_HG_CV	7439-97-6	Mercury	0.02	U	
BOPK23	7470_HG_CV	7439-97-6	Mercury	2.4		
BOPK24	7470_HG_CV	7439-97-6	Mercury	0.3		
BOPK25	7470_HG_CV	7439-97-6	Mercury	1.8		
BOPK26	7470_HG_CV	7439-97-6	Mercury	0.36		
BOPK27	7470_HG_CV	7439-97-6	Mercury	0.25		

Validation qualifiers entered into PSDS

4-12-77

R. J. Hall

SAMP_NUM	ANAL_MTHD_ID	CON_ID	CON_LONG_N	VALUE_RPTD	QUALI	VALIDATION_QU
B0PK16	6010A_META	7440-47-3	Chromium	209		
B0PK17	6010_METAL	7440-47-3	Chromium	226		J
B0PK18	6010_METAL	7440-47-3	Chromium	90.9		J
B0PK19	6010_METAL	7440-47-3	Chromium	153		J
B0PK20	6010_METAL	7440-47-3	Chromium	152		J
B0PK21	6010_METAL	7440-47-3	Chromium	131		
B0PK22	6010_METAL	7440-47-3	Chromium	0.17		U
B0PK23	6010_METAL	7440-47-3	Chromium	339		
B0PK24	6010_METAL	7440-47-3	Chromium	144		
B0PK25	6010_METAL	7440-47-3	Chromium	117		
B0PK26	6010_METAL	7440-47-3	Chromium	117		
B0PK27	6010_METAL	7440-47-3	Chromium	142		

Validation qualifiers entered into PSDS

4-12-99

RJW

SAMP NUM	ANAL_MTHD ID	CON ID	CON LONG N	VALUE RPTD	QUALI	VALIDATION QU
B0PK16	NI63_LSC	13981-37-8	Nickel-63	315		
B0PK17	NI63_LSC	13981-37-8	Nickel-63	480		J
B0PK18	NI63_LSC	13981-37-8	Nickel-63	170		J
B0PK19	NI63_LSC	13981-37-8	Nickel-63	160		J
B0PK20	NI63_LSC	13981-37-8	Nickel-63	140		J
B0PK21	NI63_LSC	13981-37-8	Nickel-63	180		J
B0PK22	NI63_LSC	13981-37-8	Nickel-63	2.2	U	J
B0PK23	NI63_LSC	13981-37-8	Nickel-63	1300		J
B0PK24	NI63_LSC	13981-37-8	Nickel-63	110		J
B0PK25	NI63_LSC	13981-37-8	Nickel-63	380		J
B0PK26	NI63_LSC	13981-37-8	Nickel-63	140		J
B0PK27	NI63_LSC	13981-37-8	Nickel-63	73		J

Validation qualifiers entered into PSDTB

4-12-99

RZNV

Date: 23 October 1998
 To: Bechtel Hanford, Inc. (technical representative)
 From: TechLaw, Inc.
 Project: 100 D Areas - Full Protocol (Waste Site 116-D-7)
 Subject: Radiochemistry - Data Package No. H0195-TNU (SDG No. H0195)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0195-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
BOPK17	8/10/98	Soil	C	See note 1
BOPK18	8/10/98	Soil	C	See note 1
BOPK19	8/10/98	Soil	C	See note 1
BOPK20	8/10/98	Soil	C	See note 1
BOPK21	8/10/98	Soil	C	See note 1
BOPK22	8/10/98	Soil	C	See note 1
BOPK23	8/10/98	Soil	C	See note 1
BOPK24	8/10/98	Soil	C	See note 1
BOPK25	8/10/98	Soil	C	See note 1
BOPK26	8/10/98	Soil	C	See note 1
BOPK27	8/10/98	Soil	C	See note 1

1 - Gamma spectroscopy; isotopic plutonium and americium; strontium-90; nickel-63.

Data validation was conducted in accordance with the BHI validation statement of work (BHI 1997) and the 100 Area Remedial Action Sampling and Analysis Plan (DOE/RL 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 elevated to the MDA and 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.

Equipment Blank

One equipment blank, sample BOPK22, was submitted for analysis. 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 3 sigma. In addition, samples may be spiked with a radiochemical tracer to assist in isolating the radioisotope of interest with the yield of the tracer being used in calculating sample activity. The acceptable range for tracer recovery is 20% to 105%. Spike sample results outside the above ranges result in associated sample results being qualified as estimates, rejected, or not qualified, depending on the activity of the individual sample.

Due to the lack of a matrix spike analysis, all nickel-63 results were qualified as estimates and flagged "J".

All other 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 or equal to 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. If either the original or replicate value is below the CRDL, the applicable control limits are less than or equal to two times the CRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

All duplicate results were acceptable.

Field Duplicates

One field duplicate pair, samples BOPK26/BOPK27, were submitted for analysis. The field duplicate pair were compared using the same criteria as laboratory duplicate pairs. The RPD for nickel-63 and europium-154 were outside QC limits. Under the BHI statement of work, no qualification is required.

- **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 specific MDA if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific TDL or contract specific MDA.

- **Completeness**

Data Package No. H0195 (SDG No. H0195) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a matrix spike analysis, all nickel-63 results were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

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: H0195	REVIEWER: TLI	DATE: 10/23/98	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Nickel-63	J	All	No matrix spike analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

Project: BECHTEL-HANFORD																							
Laboratory: TNU																							
Case		SDG: H0195																					
Sample Number		BOPK17		BOPK18		BOPK19		BOPK20		BOPK21		BOPK22		BOPK23		BOPK24		BOPK25		BOPK26		BOPK27	
Location																							
Remarks																							
Sample Date		08/10/98		08/10/98		08/10/98		08/10/98		08/10/98		08/10/98		08/10/98		08/10/98		08/10/98		08/10/98		08/10/98	
Radiochemistry	TDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Plutonium-238	0.1	0.01	U	0.007	U	0.018	U	-0.005	U	0.031		0.003	U	0.049		0.007	U	0.015	U	0.003	U	0	U
Plutonium-239/240	0.1	0.46		0.39		0.27		0.11		0.65		0.003	U	1.8		0.36		0.54		0.096		0.092	
Americium-241	0.1	0.19		0.13		0.051	U	0.025		0.23		0.013	U	0.43		0.084		0.24		0.029		0.007	U
Total Strontium	1	1.2		1		0.84		0.63		1.8		0.016	U	2		2.1		0.73		0.96		1.1	
Nickel-63	30	480	J	170	J	160	J	140	J	180	J	2.2	UJ	1300	J	110	J	380	J	140	J	73	J
Potassium-40			U	13		11		8.4		12		5.5		U	U	11		15		8.7		9.4	
Cobalt-60	0.05	19		6.8		4.3		1.8		4.9		U	U	40		4.8		16		1.5		1.8	
Cesium-137DA	0.05	41		9.2		29		18		16		U	U	0.16	U	16		21		15		15	
Europium-152	0.1	230		47		55		3.4		79		U	U	45		61		140		4.7		6.1	
Europium-154	0.1	31		7.9		7.2		0.43		10		U	U	370		7.6		18		0.59		0.9	
Europium-155	0.05	1.3		0.23		U	U	U	U	2.6		U	U	53		1.7		0.53		U	U	U	U
Radium-226		0.51		0.33		0.43		0.5		0.41		0.18		2		0.51		0.56		0.49		0.48	
Radium-228		0.89		0.57		0.59		0.5		NA		0.18		0.7		0.63		0.54	U	0.55		0.54	
Thorium-228		0.55		0.55		NA		0.77		NA		0.16		NA		NA		0.57		0.48		0.61	
Thorium-232		0.89		0.57		0.59		0.5		NA		0.18		0.59		0.63		0.54	U	0.55		0.54	
Americium-241 (GEA)	0.1		U	U		U	U	U	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	U		U	U	U	U

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0195

N808057-01

B0PK17

DATA SHEET

SDG <u>7490</u>	Client/Case no <u>Hanford</u>	SDG <u>H0195</u>
Contact <u>N. Joseph Verville</u>	Case no <u>TRB-SDB-207925</u>	
Lab sample id <u>N808057-01</u>	Client sample id <u>B0PK17</u>	
Dept sample id <u>7490-001</u>	Location/Matrix <u>116-D-7</u>	<u>SOLID</u>
Received <u>08/13/98</u>	Collected <u>08/10/98 07:45</u>	
	Custody/SAF No <u>B98-022-16</u>	<u>B98-022</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	0.010	0.010	0.039	0.050	U	PU
Plutonium 239/240	15117-48-3	0.46	0.11	0.039	0.050		PU
Americium 241	14596-10-2	0.19	0.059	0.038	0.050		AM
Total Strontium	SR-89/90	1.2	0.19	0.20	1.0		SR
Nickel 63	13981-37-8	480	19	10	20	J	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		1.2		U	GAM
Cobalt 60	10198-40-0	19	0.21	<u>0.14</u>	0.050		GAM
Cesium 137	10045-97-3	41	0.23	<u>0.20</u>	0.050		GAM
Europium 152	14683-23-9	230	0.80	<u>0.69</u>	0.10		GAM
Europium 154	15585-10-1	31	0.58	<u>0.52</u>	0.10		GAM
Europium 155	14391-16-3	1.3	0.42	<u>0.61</u>	0.10		GAM
Radium 226	13982-63-3	0.51	0.25	<u>0.36</u>	0.10		GAM
Radium 228	15262-20-1	0.89	0.60	<u>0.83</u>	0.20		GAM
Thorium 228	14274-82-9	0.55	0.15	0.24			GAM
Thorium 232	7440-29-1	0.89	0.60	0.83			GAM
Americium 241	14596-10-2	U		0.63		U	GAM
Uranium 238	U-238	U		27		U	GAM

100 D Areas - Full Protocol

Done
10/23/98

000011

Lab id <u>TMANC</u>
Protocol <u>Hanford</u>
Version <u>Ver 1.0</u>
Form <u>DVD-DS</u>
Version <u>3.06</u>
Report date <u>09/04/98</u>

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0195

N808057-02

B0PK18

DATA SHEET

SDG 7490 Client/Case no Hanford SDG H0195
 Contact N. Joseph Verville Case no TRB-SBB-207925
 Lab sample id N808057-02 Client sample id B0PK18
 Dept sample id 7490-002 Location/Matrix 116-D-7 SOLID
 Received 08/13/98 Collected 08/10/98 07:30
 Custody/SAF No B98-022-16 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	0.007	0.013	0.025	0.050	U	PU
Plutonium 239/240	15117-48-3	0.39	0.080	0.025	0.050		PU
Americium 241	14596-10-2	0.13	0.051	0.032	0.050		AM
Total Strontium	SR-89/90	1.0	0.16	0.17	1.0		SR
Nickel 63	13981-37-8	170	10	7.5	20	J	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	13	0.38	0.27			GAM
Cobalt 60	10198-40-0	6.8	0.073	0.039	0.050		GAM
Cesium 137	10045-97-3	9.2	0.068	<u>0.053</u>	0.050		GAM
Europium 152	14683-23-9	47	0.20	<u>0.13</u>	0.10		GAM
Europium 154	15585-10-1	7.9	0.18	<u>0.15</u>	0.10		GAM
Europium 155	14391-16-3	0.23	0.12	<u>0.18</u>	0.10		GAM
Radium 226	13982-63-3	0.33	0.078	0.10	0.10		GAM
Radium 228	15262-20-1	0.57	0.17	<u>0.23</u>	0.20		GAM
Thorium 228	14274-82-9	0.55	0.049	0.073			GAM
Thorium 232	7440-29-1	0.57	0.17	0.23			GAM
Americium 241	14596-10-2	U		0.17		U	GAM
Uranium 238	U-238	U		8.0		U	GAM

100 D Areas - Full Protocol

Handwritten signature
10/23/98

Lab id TMANC
 Protocol Hanford
 Version Ver 1.0
 Form DVD-DS
 Version 3.06
 Report date 09/04/98

TMA / RICHMOND
SAMPLE DELIVERY GROUP H0195

N808057-03

B0PK19

DATA SHEET

SDG 7490 Client/Case no Hanford SDG H0195
 Contact N. Joseph Verville Case no TRB-SBH-207925
 Lab sample id N808057-03 Client sample id B0PK19
 Dept sample id 7490-003 Location/Matrix 116-D-7 SOLID
 Received 08/13/98 Collected 08/10/98 09:00
 Custody/SAF No B98-022-16 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	0.016	0.022	0.042	0.050	U	PU
Plutonium 239/240	15117-48-3	0.27	0.081	0.042	0.050		PU
Americium 241	14596-10-2	0.051	0.061	<u>0.097</u>	0.050	U	AM
Total Strontium	SR-89/90	0.84	0.15	0.17	1.0	J	SR
Nickel 63	13981-37-8	160	9.1	6.3	20	J	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	11	0.55	0.34			GAM
Cobalt 60	10198-40-0	4.3	0.10	<u>0.067</u>	0.050		GAM
Cesium 137	10045-97-3	29	0.20	<u>0.14</u>	0.050		GAM
Europium 152	14683-23-9	55	0.44	<u>0.38</u>	0.10		GAM
Europium 154	15585-10-1	7.2	0.31	<u>0.26</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>0.29</u>	0.10	U	GAM
Radium 226	13982-63-3	0.43	0.14	<u>0.18</u>	0.10		GAM
Radium 228	15262-20-1	0.59	0.34	<u>0.43</u>	0.20		GAM
Thorium 232	7440-29-1	0.59	0.34	0.43			GAM
Americium 241	14596-10-2	U		0.14		U	GAM
Uranium 238	U-238	U		16		U	GAM

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PKB
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0195

N808057-05

B0PK21

DATA SHEET

SDG 7490 Client/Case no Hanford SDG H0195
 Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N808057-05 Client sample id B0PK21
 Dept sample id 7490-005 Location/Matrix 116-D-7 SOLID
 Received 08/13/98 Collected 08/10/98 09:30
 Custody/SAF No B98-022-17 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	0.031	0.018	0.023	0.050	J	PU
Plutonium 239/240	15117-48-3	0.65	0.078	0.019	0.050		PU
Americium 241	14596-10-2	0.23	0.12	<u>0.11</u>	0.050		AM
Total Strontium	SR-89/90	1.8	0.18	0.16	1.0		SR
Nickel 63	13981-37-8	180	12	9.1	20	J	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	12	0.55	0.36			GAM
Cobalt 60	10198-40-0	4.9	0.11	<u>0.075</u>	0.050		GAM
Cesium 137	10045-97-3	16	0.19	<u>0.16</u>	0.050		GAM
Europium 152	14683-23-9	79	0.49	<u>0.40</u>	0.10		GAM
Europium 154	15585-10-1	10	0.35	<u>0.30</u>	0.10		GAM
Europium 155	14391-16-3	2.6	0.35	<u>0.40</u>	0.10		GAM
Radium 226	13982-63-3	0.41	0.16	<u>0.21</u>	0.10		GAM
Americium 241	14596-10-2	U		0.15		U	GAM
Uranium 238	U-238	U		19		U	GAM

100 D Areas - Full Protocol

OK
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0195

N808057-04

B0PK20

DATA SHEET

SDG <u>7490</u>	Client/Case no <u>Hanford</u>	SDG <u>H0195</u>
Contact <u>N. Joseph Verville</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N808057-04</u>	Client sample id <u>B0PK20</u>	
Dept sample id <u>7490-004</u>	Location/Matrix <u>116-D-7</u>	<u>SOLID</u>
Received <u>08/13/98</u>	Collected <u>08/10/98 07:10</u>	
	Custody/SAF No <u>B98-022-16</u>	<u>B98-022</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	-0.005	0.010	0.039	0.050	U	PU
Plutonium 239/240	15117-48-3	0.11	0.053	0.039	0.050		PU
Americium 241	14596-10-2	0.025	0.013	0.013	0.050	J	AM
Total Strontium	SR-89/90	0.63	0.17	0.19	1.0	J	SR
Nickel 63	13981-37-8	140	12	11	20	J	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	8.4	0.26	0.15			GAM
Cobalt 60	10198-40-0	1.8	0.039	0.022	0.050		GAM
Cesium 137	10045-97-3	18	0.080	0.040	0.050		GAM
Europium 152	14683-23-9	3.4	0.071	0.086	0.10		GAM
Europium 154	15585-10-1	0.43	0.065	0.072	0.10		GAM
Europium 155	14391-16-3	U		0.077	0.10	U	GAM
Radium 226	13982-63-3	0.50	0.047	0.059	0.10		GAM
Radium 228	15262-20-1	0.50	0.091	0.11	0.20		GAM
Thorium 228	14274-82-9	0.77	0.036	0.049			GAM
Thorium 232	7440-29-1	0.50	0.091	0.11			GAM
Americium 241	14596-10-2	U		0.10		U	GAM
Uranium 238	U-238	U		3.4		U	GAM

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DATA SHEETS

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SUMMARY DATA SECTION

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Lab id <u>TMANC</u>
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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0195

N808057-06

B0PK22

DATA SHEET

SDG 7490 Client/Case no Hanford SDG H0195
 Contact N. Joseph Verville Case no TRB-SBB-207925
 Lab sample id N808057-06 Client sample id B0PK22
 Dept sample id 7490-006 Location/Matrix 116-D-7 SOLID
 Received 08/13/98 Collected 08/10/98 06:15
 Custody/SAF No B98-022-17 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	0.003	0.006	0.012	0.050	U	PU
Plutonium 239/240	15117-48-3	0.003	0.006	0.012	0.050	U	PU
Americium 241	14596-10-2	0.013	0.015	0.028	0.050	U	AM
Total Strontium	SR-89/90	0.016	0.15	0.20	1.0	U	SR
Nickel 63	13981-37-8	2.2	2.8	4.7	20	UJ	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	5.5	0.30	0.16			GAM
Cobalt 60	10198-40-0	U		0.016	0.050	U	GAM
Cesium 137	10045-97-3	U		0.012	0.050	U	GAM
Europium 152	14683-23-9	U		0.034	0.10	U	GAM
Europium 154	15585-10-1	U		0.050	0.10	U	GAM
Europium 155	14391-16-3	U		0.036	0.10	U	GAM
Radium 226	13982-63-3	0.18	0.027	0.025	0.10		GAM
Radium 228	15262-20-1	0.18	0.051	0.055	0.20	J	GAM
Thorium 228	14274-82-9	0.16	0.014	0.016			GAM
Thorium 232	7440-29-1	0.18	0.051	0.055			GAM
Americium 241	14596-10-2	U		0.052		U	GAM
Uranium 238	U-238	U		1.8		U	GAM

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0195

N808057-07

B0PK23

DATA SHEET

SDG 7490 Client/Case no Hanford SDG H0195
 Contact N. Joseph Verville Case no TRB-SBB-207925
 Lab sample id N808057-07 Client sample id B0PK23
 Dept sample id 7490-007 Location/Matrix 116-D-7 SOLID
 Received 08/13/98 Collected 08/10/98 08:05
 Custody/SAF No B98-022-17 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	0.049	0.033	0.041	0.050	J	PU
Plutonium 239/240	15117-48-3	1.8	0.22	0.040	0.050		PU
Americium 241	14596-10-2	0.43	0.11	<u>0.055</u>	0.050		AM
Total Strontium	SR-89/90	2.0	0.19	0.17	1.0		SR
Nickel 63	13981-37-8	1300	26	7.5	20	J	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	U		0.96		U	GAM
Cobalt 60	10198-40-0	40	0.18	<u>0.11</u>	0.050		GAM
Cesium 134	13967-70-9	0.16	0.13	0.19		U	GAM
Cesium 137	10045-97-3	45	0.16	<u>0.14</u>	0.050		GAM
Europium 152	14683-23-9	370	0.70	<u>0.54</u>	0.10		GAM
Europium 154	15585-10-1	53	0.47	<u>0.39</u>	0.10		GAM
Europium 155	14391-16-3	2.0	0.32	<u>0.49</u>	0.10		GAM
Radium 226	13982-63-3	0.70	0.16	<u>0.24</u>	0.10		GAM
Thorium 228	14274-82-9	0.59	0.13	0.20			GAM
Americium 241	14596-10-2	U		0.44		U	GAM
Uranium 238	U-238	U		21		U	GAM

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0195

N808057-08

B0PK24

DATA SHEET

SDG 7490 Client/Case no Hanford SDG H0195
 Contact N. Joseph Verville Case no TRB-SBB-207925
 Lab sample id N808057-08 Client sample id B0PK24
 Dept sample id 7490-008 Location/Matrix 116-D-7 SOLID
 Received 08/13/98 Collected 08/10/98 09:10
 Custody/SAF No. B98-022-17 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	0.007	0.009	0.018	0.050	U	PU
Plutonium 239/240	15117-48-3	0.36	0.062	0.023	0.050		PU
Americium 241	14596-10-2	0.084	0.031	0.019	0.050		AM
Total Strontium	SR-89/90	2.1	0.22	0.20	1.0		SR
Nickel 63	13981-37-8	110	6.6	4.6	20	J	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	11	0.59	0.38			GAM
Cobalt 60	10198-40-0	4.8	0.11	<u>0.068</u>	0.050		GAM
Cesium 137	10045-97-3	16	0.20	<u>0.16</u>	0.050		GAM
Europium 152	14683-23-9	61	0.46	<u>0.37</u>	0.10		GAM
Europium 154	15585-10-1	7.6	0.34	<u>0.29</u>	0.10		GAM
Europium 155	14391-16-3	1.7	0.62	<u>0.55</u>	0.10		GAM
Radium 226	13982-63-3	0.51	0.17	<u>0.21</u>	0.10		GAM
Radium 228	15262-20-1	0.63	0.36	<u>0.48</u>	0.20		GAM
Thorium 232	7440-29-1	0.63	0.36	0.48			GAM
Americium 241	14596-10-2	U		0.15		U	GAM
Uranium 238	U-238	U		19		U	GAM

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0195

N808057-09

B0PK25

DATA SHEET

SDG <u>7490</u>	Client/Case no <u>Hanford</u>	SDG <u>H0195</u>
Contact <u>N. Joseph Verville</u>	Case no <u>TRB-SBB-207925</u>	
Lab sample id <u>N808057-09</u>	Client sample id <u>B0PK25</u>	
Dept sample id <u>7490-009</u>	Location/Matrix <u>116-D-7</u>	<u>SOLID</u>
Received <u>08/13/98</u>	Collected <u>08/10/98 08:30</u>	
	Custody/SAF No <u>B98-022-18</u>	<u>B98-022</u>

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	0.015	0.013	0.017	0.050	U	PU
Plutonium 239/240	15117-48-3	0.54	0.080	0.024	0.050		PU
Americium 241	14596-10-2	0.24	0.052	0.021	0.050		AM
Total Strontium	SR-89/90	0.73	0.17	0.21	1.0	J	SR
Nickel 63	13981-37-8	380	15	8.3	20	J	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	15	0.72	0.58			GAM
Cobalt 60	10198-40-0	16	0.18	<u>0.11</u>	0.050		GAM
Cesium 137	10045-97-3	21	0.21	<u>0.20</u>	0.050		GAM
Europium 152	14683-23-9	140	0.60	<u>0.51</u>	0.10		GAM
Europium 154	15585-10-1	18	0.44	<u>0.40</u>	0.10		GAM
Europium 155	14391-16-3	0.53	0.28	<u>0.44</u>	0.10		GAM
Radium 226	13982-63-3	0.56	0.17	<u>0.25</u>	0.10		GAM
Radium 228	15262-20-1	0.54	0.42	<u>0.62</u>	0.20	U	GAM
Thorium 228	14274-82-9	0.57	0.12	0.18			GAM
Thorium 232	7440-29-1	0.54	0.42	0.62		U	GAM
Americium 241	14596-10-2	U		0.49		U	GAM
Uranium 238	U-238	U		22		U	GAM

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RPK
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TMA/RICHMOND
SAMPLE DELIVERY GROUP H0195

N808057-10

B0PK26

DATA SHEET

SDG 7490 Client/Case no Hanford SDG H0195
 Contact N. Joseph Verville Case no TRB-SBB-207925
 Lab sample id N808057-10 Client sample id B0PK26
 Dept sample id 7490-010 Location/Matrix 116-D-7 SOLID
 Received 08/13/98 Collected 08/10/98 06:40
 Custody/SAF No B98-022-18 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	0.003	0.006	0.024	0.050	U	PU
Plutonium 239/240	15117-48-3	0.096	0.039	0.024	0.050		PU
Americium 241	14596-10-2	0.029	0.023	0.022	0.050	J	AM
Total Strontium	SR-89/90	0.96	0.20	0.20	1.0	J	SR
Nickel 63	13981-37-8	140	9.1	7.0	20	J	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	8.7	0.28	0.15			GAM
Cobalt 60	10198-40-0	1.5	0.037	0.022	0.050		GAM
Cesium 137	10045-97-3	15	0.080	0.035	0.050		GAM
Europium 152	14683-23-9	4.7	0.081	0.083	0.10		GAM
Europium 154	15585-10-1	0.59	0.074	0.074	0.10		GAM
Europium 155	14391-16-3	U		0.089	0.10	U	GAM
Radium 226	13982-63-3	0.49	0.045	0.054	0.10		GAM
Radium 228	15262-20-1	0.55	0.10	0.12	0.20		GAM
Thorium 228	14274-82-9	0.48	0.028	0.040			GAM
Thorium 232	7440-29-1	0.55	0.10	0.12			GAM
Americium 241	14596-10-2	U		0.093		U	GAM
Uranium 238	U-238	U		3.2		U	GAM

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TMA / RICHMOND
SAMPLE DELIVERY GROUP H0195

N808057-11

B0PK27

DATA SHEET

SDG 7490 Client/Case no Hanford SDG H0195
 Contact N. Joseph Verville Case no TRB-SBB-207925
 Lab sample id N808057-11 Client sample id B0PK27
 Dept sample id 7490-011 Location/Matrix 116-D-7 SOLID
 Received 08/13/98 Collected 08/10/98 06:40
 Custody/SAF No B98-022-18 B98-022

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI- FIERS	TEST
Plutonium 238	13981-16-3	0	0.008	0.031	0.050	U	PU
Plutonium 239/240	15117-48-3	0.092	0.041	0.031	0.050		PU
Americium 241	14596-10-2	0.007	0.057	<u>0.11</u>	0.050	U	AM
Total Strontium	SR-89/90	1.1	0.19	0.19	1.0		SR
Nickel 63	13981-37-8	73	5.3	4.3	20	J	NI_L
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	9.4	0.40	0.21			GAM
Cobalt 60	10198-40-0	1.8	0.057	0.031	0.050		GAM
Cesium 137	10045-97-3	15	0.12	<u>0.062</u>	0.050		GAM
Europium 152	14683-23-9	6.1	0.15	<u>0.15</u>	0.10		GAM
Europium 154	15585-10-1	0.90	0.12	<u>0.11</u>	0.10		GAM
Europium 155	14391-16-3	U		<u>0.12</u>	0.10	U	GAM
Radium 226	13982-63-3	0.48	0.076	0.087	0.10		GAM
Radium 228	15262-20-1	0.54	0.16	0.19	0.20		GAM
Thorium 228	14274-82-9	0.61	0.067	0.078			GAM
Thorium 232	7440-29-1	0.54	0.16	0.19			GAM
Americium 241	14596-10-2	U		0.064		U	GAM
Uranium 238	U-238	U		6.3		U	GAM

100 D Areas - Full Protocol

JPS
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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

000022

Case Narrative

1.0 GENERAL

Thermo Nutech Sample Delivery Group H0195 is comprised of eleven soil samples designated under SAF No. B98-022 with a Project Designation of : 100 D Areas - Full Protocol.

The sample was received as stated on the Chain-of-Custody documents.

2.0 ANALYSIS NOTES

2.1 Nickel-63 Analyses

No problems were encountered with the analyses.

2.2 Strontium-90 Analyses

No problems were encountered with the analyses. The MDA of the blank sample was greater than the RDL.

2.3 Isotopic Plutonium Analyses

The MDA's or both the LCS and blank were greater than the RDL. All sample MDA's were less than the RDL.

2.4 Americium-241 Analyses

The yields for samples B0PK18, B0PK21, and B0PK27 were less than the lower method limit of 20% and their respective MDA's were greater than the RDL. The MDA for sample B0PK23 was 35% and the MDA was slightly greater than the RDL. Positive Am241 activity was detected in some of the samples.

2.5 Gamma Scan Analyses

Most of the nuclide MDA's were greater than their respective RDL's. Positive Co60 and Cs137 activities were detected in all but one sample (B0PK22).



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Collector ID Jacques/Rick Kerkow <i>M T Stankovich</i>	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KOERNER, CC	Data Turnaround 15 Days
Project Designation 100 D Areas - Full Protocol	Sampling Location 116-D-7	SAF No. B98-022		
Ice Chest No.	Field Logbook No. EL-1339-3	Method of Shipment Hand Delivered - Gov. Vehicle		
Shipped To <i>RIN Thermo Nutech FMA/RECRA 8/12/98 Richmond Laboratory</i>	Offsite Property No. <i>AGISU/36</i>	Bill of Lading/Air Bill No.		
Waste Designation Client determined no waste codes associated with this project.	COA			

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	None	Cool 4C	None	None	None
	Type of Container	aG	aG	aG	aG	aG	aG	aG	P
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1	1	2
	Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL

SAMPLE ANALYSIS				Activity Scan	Americium-241; Isotopic Plutonium; Isotopic Uranium	Nickel-63	Strontium-89,90 - Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See Item (1) in Special Instructions.
Sample No.	Matrix *	Sample Date	Sample Time								
B0PK25	Soil	8-10-98	0830	X	X	X	X				X 3981 A1
B0PK28	Soil	8-10-98	0640	X	X	X	X				X 3978 C7
B0PK27	Soil	8-10-98	0640	X	X	X	X				X 3978 C7

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS COA - R116D7 2F00				Matrix *	
Relinquished By <i>Stankovich</i>	Date/Time <i>8/10/98</i>	Received By <i>Renee Nielsen R. Nielsen</i>	Date/Time <i>8/10/98</i>	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)				S	- Soil
Relinquished By <i>Renee Nielsen R. Nielsen</i>	Date/Time <i>11/30</i>	Received By <i>Fed Exp</i>	Date/Time					SO	- Sediment
Relinquished By	Date/Time	Received By <i>C. S. ...</i>	Date/Time <i>8/13/98/1030</i>					SL	- Sludge
Relinquished By	Date/Time	Received By	Date/Time					W	- Water
LABORATORY SECTION	Received By	Title						O	- Oil
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By						A	- Air
								DS	- Drum Solids
								DL	- Drum Liquids
								T	- Tissue
								WI	- Wipe
								L	- Liquid
								V	- Vegetation
								X	- Other

Collector ID Jacques/Rick Kerkow <i>WATS Stankovich</i>	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KOERNER, CC	Data Turnaround 15 Days
Project Designation 100 D Areas - Full Protocol	Sampling Location 116-D-7	Field Logbook No. EL-1339-3	SAF No. B98-022	
Ice Chest No.	Offsite Property No. <i>A980076</i>	Method of Shipment Hand Delivered - Gov. Vehicle		
Shipped To <i>LN Thermo Nutech TMA/RECRA 8/2/98 Richmond Laboratory</i>	Bill of Lading/Air Bill No.			
Waste Designation Client determined no waste codes associated with this project.				COA

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	None	Cool 4C	None	None	None		
	Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1	1	2		
	Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		

SAMPLE ANALYSIS				Activity Scan	Americium-241; Isotopic Plutonium; Uranium	Nickel-63	Strontium-89,90 - Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions.
Sample No.	Matrix *	Sample Date	Sample Time								
B0PK17	Soil	8-10-98	715	X	X	X	X				X 3980 DF
B0PK18	Soil	8-10-98	0730	X	X	X	X				X 3983 C9
B0PK19	Soil	8-10-98	0900	X	X	X	X				X 3975 A2
B0PK20	Soil	8-10-98	0710	X	X	X	X				X 3979 C8

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS COA - R116D7 2F00				Matrix *	
Relinquished By <i>WATS Stankovich</i>	Date/Time <i>8-5-98</i>	Received By <i>Renee Nielsen</i>	Date/Time <i>8/10/98</i>	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)				<ul style="list-style-type: none"> S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other 	
Relinquished By <i>Renee Nielsen</i>	Date/Time <i>8/12/98</i>	Received By <i>Feb. Ex</i>	Date/Time						
Relinquished By	Date/Time	Received By <i>SANBADA</i>	Date/Time <i>8/13/98 (103)</i>						
Relinquished By	Date/Time	Received By	Date/Time						
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				B98-022-17		Page 1 of 1	
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Collector ID Jacques/Rick Kerkow / <i>Mike Stankovich</i>		Company Contact Mike Stankovich		Telephone No. 531-7620		Project Coordinator KOERNER, CC		Data Turnaround 15 Days	
Project Designation 100 D Areas - Full Protocol		Sampling Location 116-D-7		SAF No. B98-022					
Ice Chest No.		Field Logbook No. EL-1339-3		Method of Shipment Hand Delivered - Gov. Vehicle					
Shipped To <i>RJN Thermo Nutech TMA/RECRA 8/12/98 Richmond Laboratory</i>		Offsite Property No. <i>ACISL 631</i>		Bill of Lading/Air Bill No.					
Waste Designation Client determined no waste codes associated with this project.				COA					

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	None	Cool 4C	None	None	None		
	Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
	No. of Container(s)	1	1	1	1	1	1	1	2		
Special Handling and/or Storage	Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		

SAMPLE ANALYSIS				Activity Scan	Americium-241; isotopic Plutonium; Uranium	Nickel-63	Strontium-89,90 - Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertace) (Chromium, Lead)	See item (1) in Special Instructions.
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Sample No.	Matrix *	Sample Date	Sample Time									
B0PK21	Soil	8-10-98	0930	X	X	X	X				X	3962 06
B0PK22	Soil	8-10-98	0615	X	X	X	X				X	NA E
B0PK23	Soil	8-10-98	0805	X	X	X	X				X	3976 05
B0PK24	Soil	8-10-98	0910	X	X	X	X				X	3971 A3

CHAIN OF POSSESSION		Sign/Print Names				SPECIAL INSTRUCTIONS COA - R116D7 2F00				Matrix *	
Relinquished By <i>Stankovich</i>	Date/Time 8-10-98 1515	Received By <i>Renee Nielsen R. Nielsen</i>	Date/Time 8/10/98	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)				S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other			
Relinquished By <i>Renee Nielsen R. Nielsen</i>	Date/Time 8/12/98 1130	Received By <i>Fee Ey</i>	Date/Time								
Relinquished By	Date/Time	Received By <i>R-SANGALAWA</i>	Date/Time 8/13/98/1030								
Relinquished By	Date/Time	Received By	Date/Time								

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

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	<u>C</u>	D	E
PROJECT: 100D Area			DATA PACKAGE: H0195		
VALIDATOR: TLI		LAB: THU		DATE: 10/14/98	
CASE:			SDG: H0195		
ANALYSES PERFORMED					
<input type="checkbox"/> Gross Alpha/Beta	<input checked="" type="checkbox"/> Strontium-90	<input type="checkbox"/> Technetium-99	<input checked="" type="checkbox"/> Alpha Spectroscopy	<input checked="" type="checkbox"/> Gamma Spectroscopy	
<input type="checkbox"/> Total Uranium	<input type="checkbox"/> Radium-22	<input type="checkbox"/> Tritium	<input checked="" type="checkbox"/> Nickel-63		
SAMPLES/MATRIX					
BOPK 17 through BOPK 27 (11 total)					
solid					

1. Completeness N/A

Technical verification forms present? Yes No N/A

Comments: _____

2. Initial Calibration N/A

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

Initial calibration acceptable? Yes No N/A

Standards NIST traceable? Yes No N/A

Standards Expired? Yes No N/A

Comments: _____

3. Continuing Calibration N/A
- Calibration checked within one week of sample analysis? . . . Yes No N/A
- Calibration check acceptable? Yes No N/A
- Calibration check standards NIST traceable? Yes No N/A
- Calibration check standards expired? Yes No N/A

Comments: _____

4. Blanks N/A
- Method blank analyzed? Yes No N/A
- Method blank results acceptable? Yes No N/A
- Analytes detected in method blank? Yes No N/A
- Field blank(s) analyzed? Yes No N/A
- Field blank results acceptable? Yes No N/A
- Analytes detected in field blank(s)? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: _____

5. Matrix Spikes N/A
- Matrix spike analyzed? Yes No N/A
- Spike recoveries acceptable? Yes No N/A
- Spike source traceable? Yes No N/A
- Spike source expired? Yes No N/A
- Transcription/Calculation Errors? Yes No N/A

Comments: Ni-63 J

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: Thorium 232 RPD 52% - NO RDL for GEX
J/US/ used lowest MDA - OK

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: N1-63 > 21 ~~ADA~~ CRDL E0-154 > 359-

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: _____

AA

Date: 23 October 1998
 To: Bechtel Hanford Inc. (technical representative)
 From: TechLaw, Inc.
 Project: 100 D Areas - Full Protocol (Waste Site 116-D-7)
 Subject: Inorganics - Data Package No. H0195-TNU (SDG No. H0195)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0195-TNU prepared by Thermo NUtec (TNU). 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
BOPK17	8/10/98	Soil	C	See note 1
BOPK18	8/10/98	Soil	C	See note 1
BOPK19	8/10/98	Soil	C	See note 1
BOPK20	8/10/98	Soil	C	See note 1
BOPK21	8/10/98	Soil	C	See note 1
BOPK22	8/10/98	Soil	C	See note 1
BOPK23	8/10/98	Soil	C	See note 1
BOPK24	8/10/98	Soil	C	See note 1
BOPK25	8/10/98	Soil	C	See note 1
BOPK26	8/10/98	Soil	C	See note 1
BOPK27	8/10/98	Soil	C	See note 1

1- ICP metals by 6010B (lead and chromium); mercury by 7471A; chromium VI by 3060B/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

000001

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times for mercury, chromium VI and ICP metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Solid samples must be analyzed within six (6) months for ICP metals, 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 (in ug/L) 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.

Due to chromium (ICP) being detected in the preparation blank, the chromium (ICP) results in sample BOPK22 were flagged 'U'.

All other preparation blank results were acceptable.

Equipment Blank

One equipment blank, sample BOPK22 was submitted for analysis. Lead was detected in the equipment blank above the IDL. Chromium (ICP) was detected

in the equipment blank above the IDL, but the preparation blank also had chromium (ICP) detected above the IDL. Under the BHI statement of work, no qualification of results based on equipment blanks is required.

- **Accuracy**

Matrix Spike

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

Due to a matrix spike recovery of 294.9%, chromium (total) results in samples BOPK17, BOPK18, BOPK19 and BOPK20 were qualified as estimates and flagged "J".

Due to a matrix spike recovery of 279.6%, mercury results in samples BOPK17, BOPK18, BOPK19 and BOPK20 were qualified as estimates and flagged "J".

All other matrix spike recovery results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 30% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ".

Due to a laboratory duplicate RPD of 62.7%, mercury results in samples BOPK17, BOPK18, BOPK19, and BOPK20 were qualified as estimates and flagged "J".

All other laboratory duplicate recovery results were acceptable.

Field Duplicates

One set of field duplicates, samples BOPK26/BOPK27, were submitted for analysis. The sample duplicates are compared using the same criteria as that for a laboratory duplicate. The RPD for chromium VI was 73%. All other field duplicate results were acceptable. Under the BHI statement of work, no qualification is required.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against the 100 Area Remedial Action Sampling and Analysis Plan target detection limits (TDLs) or the CRDL if no TDL was specified, to ensure that laboratory detection levels meet the required criteria. The laboratory reported detection level for chromium VI in samples BONK17, BONK21, BONK22, and BONK24 were above the TDL. All other reported laboratory detection levels met the analyte specific TDL or CRDL.

- **Completeness**

Data package No. H0195-QES (SDG No. H0195) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to chromium being detected in the preparation blank, the chromium results in sample BOPK22 were flagged 'U'. Due to a matrix spike recovery of 294.9%, chromium (total) results in samples BOPK17, BOPK18, BOPK19 and BOPK20 were qualified as estimates and flagged "J". Due to a matrix spike recovery of 279.6%, mercury results in samples BOPK17, BOPK18, BOPK19 and BOPK20 were qualified as estimates and flagged "J". Due to a laboratory duplicate RPD of 62.7%, mercury results in samples BOPK17, BOPK18, BOPK19, and BOPK20 were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

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

000006

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

000008

DATA QUALIFICATION SUMMARY

SDG: H0195	REVIEWER: TLI	DATE: 10/23/98	PAGE <u>1</u> OF <u>1</u>
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chromium (ICP)	U	BOPK22	Blank contamination
Chromium (ICP)	J	BOPK17, BOPK18, BOPK19, BOPK20	Matrix spike recovery
Mercury	J	BOPK17, BOPK18, BOPK19, BOPK20	Matrix spike recovery
Mercury	J	BOPK17, BOPK18, BOPK19, BOPK20	RPD recovery

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

000010

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 08/24/98

CLIENT: TNU-MANFORD B98-022
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9808L318

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	B0PK21	% Solids	100	%	0.01	1.0
		Chromium VI	0.80	u MG/KG	0.80	1.0
-002	B0PK22	% Solids	100	%	0.01	1.0
		Chromium VI	0.80	u MG/KG	0.80	1.0
-003	B0PK23	% Solids	99.9	%	0.01	1.0
		Chromium VI	8.5	MG/KG	0.80	1.0
-004	B0PK24	% Solids	99.4	%	0.01	1.0
		Chromium VI	0.80	u MG/KG	0.80	1.0
-005	B0PK25	% Solids	100	%	0.01	1.0
		Chromium VI	1.3	MG/KG	0.80	1.0
-006	B0PK26	% Solids	100	%	0.01	1.0
		Chromium VI	1.4	MG/KG	0.80	1.0
-007	B0PK27	% Solids	100	%	0.01	1.0
		Chromium VI	3.0	MG/KG	0.80	1.0

000012

DATA

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 08/24/98

CLIENT: TNU-HANFORD B98-022
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9808L335

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-----	-----	-----	-----	-----	-----	-----
-001	BOPK17	% Solids	99.7	%	0.01	1.0
		Chromium VI	0.80 u	MG/KG	0.80	1.0
-002	BOPK18	% Solids	99.6	%	0.01	1.0
		Chromium VI	3.8	MG/KG	0.80	1.0
-003	BOPK19	% Solids	99.9	%	0.01	1.0
		Chromium VI	2.9	MG/KG	0.80	1.0
-004	BOPK20	% Solids	99.8	%	0.01	1.0
		Chromium VI	18.0	MG/KG	0.80	1.0

000013

0052

Recre LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 09/11/98

CLIENT: TNU-HANFORD B98-022

RECRA LOT #: 9806L318

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
-001	B0PK21	Chromium, Total	131	MG/KG	0.08	1.0
		Mercury, Total	0.22	MG/KG	0.02	1.0
		Lead, Total	4.3	MG/KG	0.18	1.0
-002	B0PK22	Chromium, Total	0.17	MG/KG	0.08	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	1.2	MG/KG	0.18	1.0
-003	B0PK23	Chromium, Total	339	MG/KG	0.07	1.0
		Mercury, Total	2.4	MG/KG	0.03	2.0
		Lead, Total	7.8	MG/KG	0.17	1.0
-004	B0PK24	Chromium, Total	144	MG/KG	0.07	1.0
		Mercury, Total	0.30	MG/KG	0.02	1.0
		Lead, Total	4.4	MG/KG	0.16	1.0
-005	B0PK25	Chromium, Total	117	MG/KG	0.06	1.0
		Mercury, Total	1.8	MG/KG	0.03	2.0
		Lead, Total	7.7	MG/KG	0.15	1.0
-006	B0PK26	Chromium, Total	117	MG/KG	0.06	1.0
		Mercury, Total	0.36	MG/KG	0.01	1.0
		Lead, Total	3.9	MG/KG	0.15	1.0
-007	B0PK27	Chromium, Total	142	MG/KG	0.07	1.0
		Mercury, Total	0.25	MG/KG	0.01	1.0
		Lead, Total	4.1	MG/KG	0.17	1.0

Recre LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 09/11/98

CLIENT: TNU-HANFORD B98-022
 WORK ORDER: 10985-001-001-9999-00

RECRA LOT #: 9808L335

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
-001	B0PK17	Chromium, Total	226	MG/KG	0.08	1.0
		Mercury, Total	0.38	MG/KG	0.01	1.0
		Lead, Total	8.0	MG/KG	0.19	1.0
-002	B0PK18	Chromium, Total	90.9	MG/KG	0.08	1.0
		Mercury, Total	0.19	MG/KG	0.01	1.0
		Lead, Total	6.2	MG/KG	0.19	1.0
-003	B0PK19	Chromium, Total	153	MG/KG	0.07	1.0
		Mercury, Total	0.23	MG/KG	0.02	1.0
		Lead, Total	10.3	MG/KG	0.17	1.0
-004	B0PK20	Chromium, Total	152	MG/KG	0.08	1.0
		Mercury, Total	0.24	MG/KG	0.02	1.0
		Lead, Total	4.9	MG/KG	0.18	1.0

000015

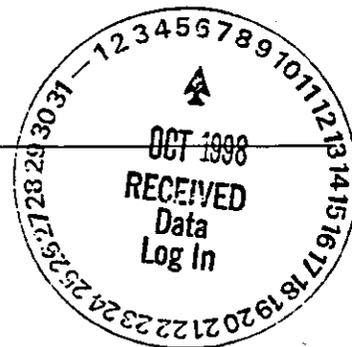
Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation



a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B98-022

RFW# : 9808L318;335

SDG# : H0195

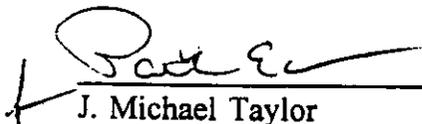
SAF# : B98-022

W.O. # : 10985-001-001-9999-00

Date Received: 08-13,14-98

INORGANIC CASE NARRATIVE

1. This narrative covers the analyses of 11 soil samples.
2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.
3. Sample holding times as required by the method and/or contract were met.
4. The cooler temperatures were 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. The duplicate LCS was within the 20% Relative Percent Difference (RPD) control limit.
7. The matrix spike recoveries were within the 75-125% control limits.
8. The replicate analyses were within the 20% RPD control limit.
9. Results for solid samples are reported on a dry weight basis.



J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory

9-23-98
Date

njpu08-318.335

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 21 pages.

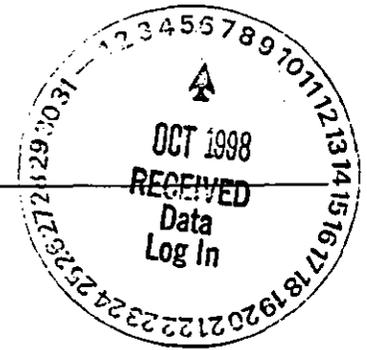
000017



**RECRA
LabNet**

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B98-022
RFW# : 9808L318
SDG/SAF# : H0195/B98-022

W.O.# : 10985-001-001-9999-00
Date Received: 08-13-98

METALS CASE NARRATIVE

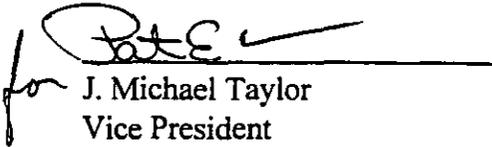
1. This narrative covers the analyses of 7 soil samples.
2. Samples were prepared and analyzed in accordance with methods checked on the attached glossary. The sample matrix created difficulties in maintaining calibration criteria. Please refer to statement 5.
3. All analyses were performed within the 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 control limits except the ending CCV for both analytes. Only the last two samples are impacted. Both CCVs went out high with recoveries above 130% (CR at 138.8% and PB at 148.9%). These samples were run over a two day period in three separate files. In each case, the CCV recoveries trended upward as the samples were analyzed. The instrument was calibrated for an HSL list and while most analytes were detected, none were extremely high. In all files, the CCV recovery was in the range of 130% to 170% for every analyte. Other files were completed between these runs and the instrument maintained its calibration throughout the file. It appears that the sample matrix caused the high CCV recoveries. A comparison of the sample results between the files gives similar numbers.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits.
7. All preparation/method blanks were within method criteria. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The matrix spike (MS) recovery for 1 analyte was outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

000018

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration levels, due to high concentrations of the following analytes:

<u>Sample ID</u>	<u>Element</u>	<u>PDS Concentration (ppb)</u>	<u>PDS % Recovery</u>
BOPK21	Chromium	800	92.4

12. All duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. 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.


for J. Michael Taylor
Vice President
Philadelphia Analytical Laboratory
mld/m08-318

10-1-98
Date



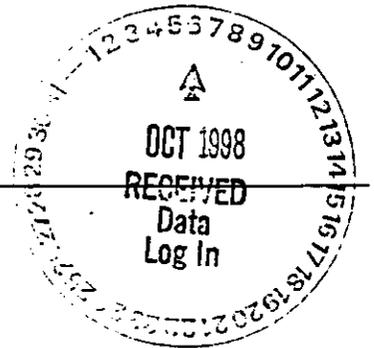
000019



**RECRA
LabNet**

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere



**Recra LabNet Philadelphia
Analytical Report**

Client : TNU-HANFORD B98-022

RFW# : 9808L335

SDG/SAF# : H0195/B98-022

W.O.# : 10985-001-001-9999-00

Date Received: 08-14-98

METALS CASE NARRATIVE

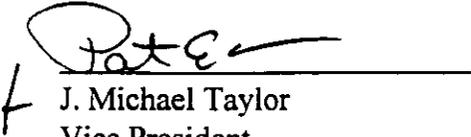
1. This narrative covers the analyses of 4 soil samples.
2. Samples were prepared and analyzed in accordance with methods checked on the attached glossary. The sample matrix created difficulties in maintaining calibration criteria. Please refer to statement 5.
3. All analyses were performed within the 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 control limits except the ending CCV for both analytes. Both CCVs went out high with recoveries above 130% (CR at 138.8% and PB at 148.9%). These samples were run over a two day period in three separate files. In each case, the CCV recoveries trended upward as the samples were analyzed. The instrument was calibrated for an HSL list and while most analytes were detected, none were extremely high. In all files, the CCV recovery was in the range of 130% to 170% for every analyte. Other files were completed between these runs and the instrument maintained its calibration throughout the file. It appears that the sample matrix caused the high CCV recoveries. A comparison of the sample results between the files gives similar numbers.
6. All Initial and Continuing Calibration Blanks (ICB/CCBs) were within control limits.
7. All preparation/method blanks were within method criteria. Refer to the Inorganics Method Blank Data Summary.
8. All ICP Interference Check Standards were within control limits.
9. All laboratory control samples (LCS) were within the laboratory control limits. Refer to the Inorganics Laboratory Control Standards Report.
10. The matrix spike (MS) recoveries for 2 analytes were outside the 75-125% control limits. Refer to the Inorganics Accuracy Report.

000020

11. For analytes where the ICP MS is out-of-control, a post-digestion MS (PDS) and serial dilution are performed. A PDS was prepared at meaningful concentration levels, due to high concentrations of the following analytes:

<u>Sample ID</u>	<u>Element</u>	<u>PDS</u> <u>Concentration (ppb)</u>	<u>PDS</u> <u>% Recovery</u>
BOPK17	Chromium	1200	109.1

12. The duplicate analysis for 1 analyte was outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.
13. 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/m08-335

10-1-99
Date



000021

002

Collector ID Jacques/Rick Kerkow / <i>M.T. Stankovich</i>	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KOERNER, CC	Data Turnaround 15 Days
Project Designation 100 D Areas - Full Protocol	Sampling Location 116-D-7	SAF No. B98-022		
Ice Chest No.	Field Logbook No. EL-1339-3	Method of Shipment Hand Delivered - Gov. Vehicle		
Shipped To TMA/RECRA	Offsite Property No. <i>A980437</i>	Bill of Lading/Air Bill No.		
Waste Designation Client determined no waste codes associated with this project.				COA

1201

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	None	Cool 4C	None	None	None	
	Type of Container	aG	aG	aG	aG	aG	aG	aG	P	
	No. of Container(s)	1	1	1	1	1	1	1	2	
Special Handling and/or Storage	Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL	

SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium; Uranium	Nickel-63	Strontium-89,90 - Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions.
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Sample No.	Matrix *	Sample Date	Sample Time								
B0PK17	Soil	8-10-98	0747				X	A	X		3980 BY
B0PK18	Soil	8-10-98	0730				✓	✓	✓		3983 C9
B0PK19	Soil	8-10-98	0900				X	X	✓		3975 A2
B0PK20	Soil	8-10-98	0710				X	✓	X		3974 C8

900022

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS COA - R116D7 2F00				Matrix * S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other
	Relinquished By <i>Stankovich</i>	Date/Time 8-10-98	Received By <i>R. Nielsen</i>	Date/Time 8/10/98	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)		
	Relinquished By <i>R. Nielsen</i>	Date/Time 8/12/98	Received By <i>Fed Ex</i>	Date/Time			
	Relinquished By <i>Fed Ex</i>	Date/Time	Received By <i>L. Landry</i>	Date/Time 8/14/98			
Relinquished By	Date/Time	Received By	Date/Time				

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

Collector ID Jacques/Rick Kerkow <i>MT Stankovich</i>	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KOERNER, CC	Data Turnaround 15 Days
Project Designation 100 ID Areas - Full Protocol	Sampling Location 116-D-7	Field Logbook No. EL-1339-3	SAF No. B98-022	
Ice Chest No.	Offsite Property No. <i>AG 8103</i>	Method of Shipment Hand Delivered - Gov. Vehicle		
Shipped To TMA/RECKA <i>1. 1. 1</i> <i>K.P. 5/11/98</i>	Waste Designation Client determined no waste codes associated with this project.	Bill of Lading/Air Bill No. COA		

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	None	Cool 4C	None	None	None		
	Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1	1	2		
	Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		

SAMPLE ANALYSIS				Activity Scan	Americium-241; Isotopic Plutonium; Cesium Uranium	Nickel-63	Strontium-89,90 -- Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions	
Sample No.	Matrix *	Sample Date	Sample Time									
B0PK25	Soil	8-10-98	0830						X	X	3981	A1
B0PK26	Soil	8-10-98	0640						X	X	3978	C-7
B0PK27	Soil	8-10-98	0640						X	X	3978	C-7

CHAIN OF POSSESSION		Sign/Print Names		SPECIAL INSTRUCTIONS COA - R116D7 2F00				Matrix *	
Relinquished By <i>Stankovich</i>	Date/Time 8-10-98	Received By <i>P. Nelson</i>	Date/Time 8-10-98	(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)				<ul style="list-style-type: none"> S - Soil SE - Sediment SO - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other 	
Relinquished By <i>P. Nelson</i>	Date/Time 8/12/98	Received By <i>Feal. Ey</i>	Date/Time						
Relinquished By <i>Deley</i>	Date/Time	Received By <i>Juzler</i>	Date/Time 8/13/98 0930						
Relinquished By	Date/Time	Received By	Date/Time						

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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-022-17

Page 1 of 1

DTR

Collector ID Jacques/Rick Kerkow <i>MIT Stankovich</i>	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KOERNER, CC
Project Designation 100 D Areas - Full Protocol		Sampling Location 116-D-7	SAF No. B98-022
Ice Chest No.	Field Logbook No. EL-1339-3	Method of Shipment Hand Delivered - Gov. Vehicle	
Shipped To TMA/RECRA <i>100 D Areas</i>	Offsite Property No. <i>A9830437</i>	Bill of Lading/Air Bill No.	
Waste Designation Client determined no waste codes associated with this project.			COA

15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

2/18

Special Handling and/or Storage

Preservation	None	None	None	None	Cool 4C	None	None	None	None
Type of Container	aG	aG	aG	aG	aG	aG	aG	aG	P
No. of Container(s)	1	1	1	1	1	1	1	1	2
Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL	

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Americium-241; isotopic Plutonium; Isotopic Uranium	Nickel-63	Strontium-89,90 - Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See Item (1) in Special Instructions
B0PK21	Soil	8-10-98	0930					X	X	X	3982
B0PK22	Soil	8-10-98	0615					X	X	X	NA
B0PK23	Soil	8-10-98	0805					X	X	X	3976
B0PK24	Soil	8-10-98	0910					X	X	X	3977

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By <i>Stankovich</i>	Received By <i>Renee Nelson R. Nelson</i>	8-10-98 1515
Relinquished By <i>R. Nelson</i>	Received By <i>Fed 24</i>	8/12/98 1130
Relinquished By <i>Fed 24</i>	Received By <i>Julier</i>	8/18/98 0930

SPECIAL INSTRUCTIONS
COA - R116D7 2F00

(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

4235 7951 5820

- Matrix ***
- S - Soil
 - SE - Sediment
 - SO - Solid
 - SL - 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

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-022-18

Page 1 of 1

Collector ID Jacques/Rick Kerkow <i>MAT Stankovich</i>	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KOERNER, CC	Data Turnaround 15 Days
Project Designation 1001 Areas - Full Protocol	Sampling Location 116-D-7	SAF No. B98-022		
Ice Chest No.	Field Logbook No. EL-1339-3	Method of Shipment Hand Delivered - Gov. Vehicle		
Shipped To TMA/RECRA <i>116-D-7</i>	Offsite Property No. <i>AG 116-D-7</i>	Bill of Lading/Air Bill No.		

Waste Designation Client determined no waste codes associated with this project.

COA

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	None	Cool 4C	None	None	None	
	Type of Container	aG	aG	aG	aG	aG	aU	aG	P	
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1	1	2	
	Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL	

SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium; Uranium, Thorium	Nickel-63	Strontium-89,90 - Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	HCP Metals - 6010A (Supertrace) [Chromium, Lead]	See item (1) in Special Instructions
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Sample No.	Matrix *	Sample Date	Sample Time							
B0PK25	Soil	8-10-98	0830					X	X	3981 AI
B0PK26	Soil	8-10-98	0640					X	X	3978 C-
B0PK27	Soil	8-10-98	0640					X	X	3978 C-

000025

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Relinquished By <i>[Signature]</i> Date/Time <i>8-10-98 12:5</i>	Received By <i>R. Nielsen</i> Date/Time <i>8/10/98 15:5</i>	COA - R116D7 2F00 (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)	S - Soil
Relinquished By <i>R. Nielsen</i> Date/Time <i>8/12/98 1130</i>	Received By <i>F. E. Ex</i> Date/Time		SE - Sediment
Relinquished By <i>[Signature]</i> Date/Time	Received By <i>[Signature]</i> Date/Time <i>8/13/98 0930</i>		SO - Solid
Relinquished By	Received By		SL - 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

Collector ID Jacques/Rick Kerkow <i>MT Stankovich</i>	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KOERNER, CC	Data Turnaround 15 Days
Project Designation 100 D Areas - Full Protocol	Sampling Location 116-D-7	Field Logbook No. EL-1339-3	Method of Shipment Hand Delivered - Gov. Vehicle	
Shipped To TMA/RECRA <i>Lab</i>	Offsite Property No. <i>A930437</i>	Bill of Lading/Air Bill No.		
Waste Designation Client determined no waste codes associated with this project.			COA	

POSSIBLE SAMPLE HAZARDS/REMARKS <i>218</i>	Preservation	None	None	None	None	Cool 4C	None	None	None		
	Type of Container	uG	uG	uG	uG	uG	uG	uG	P		
	No. of Container(s)	1	1	1	1	1	1	1	2		
	Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		

SAMPLE ANALYSIS	Activity Scan	Americium-241; Isotopic Plutonium; Isotopic Uranium	Nickel-63	Strontium-89,90 - Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (I) in Special Instructions		
	Special Handling and/or Storage									

CHAIN OF POSSESSION	Sign/Print Names	SPECIAL INSTRUCTIONS	Matrix *
Inquired By <i>Stankovich</i>	Date/Time <i>8-10-98 1515</i>	Received By <i>Renee Nelson R. Nelson</i>	Date/Time <i>8/10/98</i>
Inquired By <i>R. Nelson</i>	Date/Time <i>8/12/98 1130</i>	Received By <i>Fel 24</i>	Date/Time
Inquired By <i>Deley</i>	Date/Time	Received By <i>Jaler</i>	Date/Time <i>8/18/98 0930</i>
Inquired By	Date/Time	Received By	Date/Time

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

000026

13

SPECIAL INSTRUCTIONS
COA - R116D7 2B00
(1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)

4235 7951 5820 *3x*

- S - Soil
- SE - Sediment
- SO - Solid
- SL - Sludge
- W - Water
- O - Oil
- A - Air
- DS - Drum Solids
- DL - Drum Liquids
- T - Tissue
- WT - Wipe
- L - Liquid
- V - Vegetation
- X - Other

Collector ID Jacques/Rick Kerkow <i>Mike Stankovich</i>	Company Contact Mike Stankovich	Telephone No. 531-7620	Project Coordinator KOERNER, CC	Data Turnaround 15 Days
Project Designation 100 D Areas - Full Protocol	Sampling Location 116-D-7		SAF No. B98-022	
Ice Chest No.	Field Logbook No. EL-1339-3		Method of Shipment Hand Delivered - Gov. Vehicle	
Shipped To EPA/RECRA U.S. EPA	Offsite Property No. A196437		Bill of Lading/Air Bill No.	

Waste Designation Client determined no waste codes associated with this project. COA

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	None	Cool 4C	None	None	None		
	Type of Container	aG	aG	aG	aG	aG	aG	aG	P		
Special Handling and/or Storage	No. of Container(s)	1	1	1	1	1	1	1	2		
	Volume	20mL	60mL	60mL	60mL	120mL	120mL	250mL	1000mL		

SAMPLE ANALYSIS	Activity Scan	Americium-241; isotopic Phosphorus; Cesium; Uranium	Nickel-63	Strontium-89,90 - Total Sr	Chromium Hex - 7196	Mercury - 7471 - (CV)	ICP Metals - 6010A (Supertrace) (Chromium, Lead)	See item (1) in Special Instructions		
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Sample No.	Matrix *	Sample Date	Sample Time									
B0PK17	Soil	8-10-98	0747				X	A	X		3980	B4
B0PK18	Soil	8-10-98	0730				✓	✓	✓		3983	C2
B0PK19	Soil	8-10-98	0900				X	X	✓		3975	A2
B0PK20	Soil	8-10-98	0710				X	X	X		3979	C8

CHAIN OF POSSESSION	Sign/Print Names		SPECIAL INSTRUCTIONS COA - R116D7 2F00 (1) Gamma Spectroscopy (Cesium-137, Cobalt-60, Europium-152, Europium-154, Europium-155); Gamma Spec - Add-on (Americium-241, Uranium-238)	Matrix * S - Soil SE - Sediment SD - Solid SL - Sludge W - Water O - Oil A - Air DS - Drum Solids DL - Drum Liquids T - Tissue WI - Wipe L - Liquid V - Vegetation X - Other		
	Relinquished By <i>Stankovich</i>	Date/Time <i>8-10-98 15:15</i>			Received By <i>Renee Nielsen R. Nielsen</i>	Date/Time <i>8/10/98 15:15</i>
	Relinquished By <i>Renee Nielsen R. Nielsen</i>	Date/Time <i>8/12/98 11:30</i>			Received By <i>Fed Ex</i>	Date/Time
	Relinquished By <i>Fed ex</i>	Date/Time			Received By <i>J. Landry</i>	Date/Time <i>8/14/98 3:00</i>

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

Appendix 5
Data Validation Supporting Documentation

000028

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT:	100-D Areas		DATA PACKAGE: H0195		
VALIDATOR:	TLI	LAB: TNV	DATE: 10/16/95		
CASE:			SDG: H0-195 H0195		
ANALYSES PERFORMED					
<input checked="" type="checkbox"/> CLP/ICP	<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/ICP	<input type="checkbox"/> SW-846/GFAA	<input checked="" type="checkbox"/> SW-846/Hg	<input type="checkbox"/> SW-846 Cyanide	<input type="checkbox"/>	<input type="checkbox"/>
SAMPLES/MATRIX					
BUNK 17 - BUNK 27 (11 total)					
Solid					

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: Variance for CP VI - 30 days

Hg → 28

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: CR VI
Chromium (total) in blank (U all < 5X Blank (1.05)
CK22
FB - lead + CR (ICP)

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: CR VI
BOPK 17 - K20 (Cr total) 294.99% J/J
H₂ 277.69% J/J

A 207

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: CRUI - Dup 7390 (field dup)
 -Hg -> K17 - K20 J/JT

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: CRVI - (NO)

Recre LabNet - Lionville

INORGANICS METHOD BLANK DATA SUMMARY PAGE 09/11/98

CLIENT: TNU-HANFORD 898-022

RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING	DILUTION
					LIMIT	FACTOR
BLANK1	98L1143-MB1	Chromium, Total	0.21	MG/KG	0.08	1.0
		Lead, Total	0.19 u	MG/KG	0.19	1.0
BLANK1	98C0420-MB1	Mercury, Total	0.02 u	MG/KG	0.02	1.0

000032

000033

SAMPLE	SIZE ID	ANALYTE	SPICED	INITIAL	AMOUNT	RECOV	FACTOR(SPK)	DILUTION
-001	BOPK17	Chromium, Total	283	226	19.5	294.9*	1.0	1.0
		Mercury, Total	0.85	0.38	0.17	279.6	1.0	1.0
		Lead, Total	64.8	8.0	48.7	116.6	1.0	1.0

CLIENT: TRU-HANFORD 898-022
 WORK ORDER: 10985-001-001-9999-00

RECMA LOT #: 9808135

INORGANICS ACCURACY REPORT 09/11/98

Recma Labnet - Louisville

Recre LabNet - Lionville

INORGANICS PRECISION REPORT 09/11/98

CLIENT: TNU-HANFORD B98-022

RECRA LOT #: 9808L335

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

SAMPLE	SITE ID	ANALYTE	INITIAL			DILUTION
			RESULT	REPLICATE RPD		FACTOR (REP)
-001REP	BOPK17	Chromium, Total	226	258	13.6	1.0
		Mercury, Total	0.38	0.73	62.7	1.0
		Lead, Total	8.0	7.8	2.5	1.0

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
099	MEMORY TX		3755151	03/03	OK

ERRORS

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

Bechtel Hanford, Inc.
 3350 George Washington Way
 Richland, WA 99352

Attn: BHI Sample Management
 3190 George Washington Way
 MSIN: H9-03
 Phone: 375-9439
 FAX: 372-9487



Fax

To: Bruce Christian	From: Jeauette Duncan
Fax: 375-5151	Pages: 3
Phone:	Date: 11/3
Re:	CC:

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

Attn: BHI Sample Management
3190 George Washington Way
MSIN: H9-03
Phone: 375-9439
FAX: 372-9487

BHI Sample Management

Fax

To: Bruce Christian From: Jeanette Duncan
Fax: 375-5151 Pages: 3
Phone: Date: 11/3
Re: CC:

Urgent For Review Please Comment Please Reply Please Recycle

● Comments:

You + Rich have talked about Blumenkranz's comment - please make appropriate clarification. Also - I've attached Claude's comment(s) ... Please make changes.

Can this be done by Thurs COB?

Let me know -

Jeanette

375-9439

Bechtel Hanford, Inc.
3350 George Washington Way
Richland, WA 99352

BHI Sample Management

Attn: BHI Sample Management
3190 George Washington Way
MSIN: H9-03
Phone: 375-9439
FAX: 372-9487

Fax

To: Bruce Christian **From:** Jeanette Duncan
Fax: 375-5151 **Pages:** 2
Phone: **Date:** 10/27
Re: **CC:**

Urgent **For Review** **Please Comment** **Please Reply** **Please Recycle**

● **Comments:**

Can you let me know "how much"
ASAP?

Jeanette

Author: Jonathan D (Jon) Fancher at ~BHI016
Date: 10/27/98 9:42 AM
Priority: Normal
TO: Richard L Weiss at ~BHI012
TO: Jeanette M Duncan at ~BHI012
CC: Mark H Sturges at ~BHI001
TO: David B Blumenkranz at ~BHI001
CC: Joan H Kessner at ~BHI012
Subject: Re: Validation package H0195-TNU

----- Message Contents -----

Rich

Can someone check with the validator and see what the additional cost of adding a list of samples and corresponding analyses that did not meet the MDLs of the SAP to the validation package. I'm thinking the cost will be pretty small.

jon

Reply Separator

Subject: Validation package H0195-TNU
Author: David B Blumenkranz at ~BHI001
Date: 10/27/98 8:28 AM

Rich & Jeanette,

My only comment on validation package H0195-TNU (inorganics & radiochemistry) is that the validator did not compare detection limits of the lab with those specified in Table II-2 of the SAP. If this could be added to the validation then all SAP PARCC parameters would have been evaluated by the time the data validator is through doing his thing. No qualification would be required, just a list of samples and corresponding analyses that did not meet the MDLs of the SAP. However, I do not have the authority to approve additional budget for such an effort and I do know that it is not much effort on our part to compare SAP MDLs in house. (Any advice Mark & Jon?).

Please let the validator know I was pleased with the validation and that 100 Areas Remedial Action project intends to have the SAP comparison, as currently done in the validation, remain a routine part of our closure sample validation.

Thanks,
Dave

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
018	MEMORY TX		3755151	02/02	OK

ERRORS

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

Bechtel Hanford, Inc.
 3350 George Washington Way
 Richland, WA 99352

Attn: BHI Sample Management
 3180 George Washington Way
 MSIN: H9-03
 Phone: 375-9439
 FAX: 372-9487



Fax

To: Bruce Christian	From: Jeanette Duncan
Fax: 375-5151	Pages: 2
Phone:	Date: 10/27
Re:	CC:

- Urgent
- For Review
- Please Comment
- Please Reply
- Please Recycle

H0195

Blumenkranz's
second set of
comments

All pg changes

All other laboratory duplicate recovery results were acceptable.

Field Duplicates

One set of field duplicates, samples BOPK26/BOPK27, were submitted for analysis. The sample duplicates are compared using the same criteria as that for a laboratory duplicate. The RPD for chromium VI was 73%. All other field duplicate results were acceptable. Under the BHI statement of work, no qualification is required.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against 100 Area Remedial Action Sampling and Analysis Plan analytical detection requirements to ensure that laboratory detection levels meet the required criteria. The laboratory reported detection level for chromium VI in samples BOKK17, BOKK21, BOKK22, and BOKK24 were above the CRDL. All other reported laboratory detection levels met the analyte specific CRDL.

- **Completeness**

Data package No. H0195-QES (SDG No. H0195) was submitted for validation and verified for completeness. The completion percentage was 100%.

Please clarify CRDL and/or 100 Area Remedial Action Sampling and Analysis Plan req'd detection limits

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to chromium being detected in the preparation blank, the chromium results in sample BOPK22 were flagged 'U'. Due to a matrix spike recovery of 294.9%, chromium (total) results in samples BOPK17, BOPK18, BOPK19 and BOPK20 were qualified as estimates and flagged "J". Due to a matrix spike recovery of 279.6%, mercury results in samples BOPK17, BOPK18, BOPK19 and BOPK20 were qualified as estimates and flagged "J". Due to a laboratory duplicate RPD of 62.7%, mercury results in samples BOPK17, BOPK18, BOPK19, and BOPK20 were qualified as estimates and flagged "J". Data flagged "J" is an estimate, but under the BHI validation SOW, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

Due to the lack of a matrix spike analysis, all nickel-63 results were qualified as estimates and flagged "J".

All other accuracy results were

• Precision

Comments for H0195 (116-D-7) VSR B99-001

Analytical matrix spikes using ur are greater than percent, the CRDL either the limits are is outside estimated

between the recoveries of duplicate Precision may also be assessed both sample and replicate activities RPD is less than or equal to 30 activities are less than five times two times the CRDL is used. If CRDL, the applicable control DL for soil samples. If the RPD results are qualified as

All duplicate results were acceptable.

Field Duplicates

One field duplicate pair, samples BOPK26/BOPK27, were submitted for analysis. The field duplicate pair were compared using the same criteria as laboratory duplicate pairs. The RPD for nickel-63 and europium-154 were outside QC limits. Under the BHI statement of work, no qualification is required.

• Detection Levels

Reported laboratory detection levels are reviewed to ensure that they are at or below the 100 Area Remedial Action Sampling and Analysis Plan required detection limits. All reported MDAs were at or below the analyte-specific limits.

• Completeness

Please clarify 100 Area Remedial Action Sampling and Analysis Plan req'd detection limits and/or CRDL.

Data Package No. H0195 (SDG No. H0195) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.



Review Comment Record (RCR)

1. Date 11/02/98	2. Review No. BHI/QA98012
	3. Project 116-D7

5. Document Number(s)/Title(s) H0195 - TNU (SDG No. H0195)	6. Program/Project/ Building Number 116-D-7 Waste Site Soil Samples	7. Reviewer Claude Stacey	8. Organization/Group BHI/QA	9. Location/Phone HO-16/372-9208
---	--	------------------------------	---------------------------------	-------------------------------------

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

Organization Manager (Optional) _____ Date _____ Reviewer/Point of Contact _____ Date 11/24/98 Reviewer/Point of Contact Claude Stacey

Author/Originator _____ Author/Originator _____

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
1	Inorganic: Page 02, Preparation Blanks, The paragraph indicates the preparation blank consisted of deionized distilled water reported as ug/L. Page 32, laboratory method blank summary indicates the blank values were reported as MG/KG which would indicate the preparation blank was solid material).		Corrected (66)	
2				
3				

Post-It® Fax Note 7671

Date	11/24/98	# of pages	1
To	Jeanette Duran		
From	Claude Stacey		
Co./Dept.	Co.		
Phone #	375-9439	Phone #	372-9208
Fax #	372-9487	Fax #	

THE FOLLOWING FILE(S) ERASED

FILE	FILE TYPE	OPTION	TEL NO.	PAGE	RESULT
079	MEMORY TX		3729447	10/10	OK

ERRORS

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

Bechtel Hanford, Inc.
 3350 George Washington Way
 Richland, WA 99352

ERC Field Sampling

Attn: ERC Field Sampling
 3180 George Washington Way
 MSIN: H9-03
 Phone: 378-8439
 FAX: 372-9487

Fax

To: Claude Stacey From: Jeanette Duncan
 Fax: 372-9447 Pages: 10
 Phone: 372-9208 Date: 11/24/98
 Re: D-7 Validation CC:

~~Important~~ For Review Please Comment Please Reply Please Recycle

Review Comment Record (RCR)

1. Date
11/02/98

2. Review No.
BHI/QA98012

3. Project
116-D 7

4. Page
Page 1 of 1

5. Document Number(s)/Title(s)
H0195 - TNU (SDG No. H0195)

6. Program/Project/
Building Number
116-D-7 Waste Site Soil
Samples

7. Reviewer
Claude Stacey

8. Organization/Group
BHI/QA

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

17. Comment Submittal Approval:

10. Agreement with indicated comment disposition(s)

11. CLOSED

Organization Manager (Optional)

Date

Reviewer/Point of Contact

Date

Reviewer/Point of Contact

Author/Originator

Author/Originator

12. Item	13. Comment(s)/Discrepancy(s) (Provide technical justification for the comment and detailed recommendation of the action required to correct/resolve the discrepancy/problem indicated.)	14. Hold Point	15. Disposition (Provide justification if NOT accepted.)	16. Status
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2				
3				

Author: David B Blumenkranz at ~BHI001
Date: 10/27/98 8:28 AM
Priority: Normal
TO: Richard L Weiss at ~BHI012
TO: Jeanette M Duncan at ~BHI012
CC: Mark H Sturges
CC: Jonathan D (Jon) Fancher at ~BHI016
Subject: Validation package H0195-TNU

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Dave