Date: 25 September 1998
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 216-A-29 Ditch - Soil
Subject: Inorganics - Data Package No. H0164-RLN (SDG No. H0164)

AUG 1999 RECEIVED EDMC

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0164-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
B0P708	7/6/98	Soil	C	See Note 1
B0P710	7/6/98	Soil	C	See Note 1
B0P712	7/6/98	Soil	C	See Note 1
B0P714	7/6/98	Soil	C	See Note 1
B0P716	7/7/98	Soil	C	See Note 1
B0P718	7/7/98	Soil	C	See Note 1
B0P720	7/7/98	Soil	C	See Note 1
B0P722	7/7/98	Soil	C	See Note 1
B0P724	7/7/98	Soil	C	See Note 1
B0P726	7/7/98	Soil	C	See Note 1

1- ICP metals by 6010A; mercury by 7470A

Data validation was conducted in accordance with the BHI validation statement of work. 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 mercury and ICP metals are assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be analyzed within six (6) months for ICP metals 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.

  All preparation blank results were acceptable.

- **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 75% to

125%. 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 74% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% 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 35% 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 20% 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 recovery results were acceptable.

Field Duplicates

Two field duplicate pairs (BOP710/BOP712 and BOP720/BOP722) were submitted for analysis. The sample duplicate pairs 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 CRDLs to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific CRDL.

- **Completeness**

Data package No. H0164-RLN (SDG No. H0164) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

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: H0164	REVIEWER: TLI	DATE: 9/25/98	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: H0164																				
Sample Number		B0P708		B0P710		B0P712		B0P714		B0P716		B0P718		B0P720		B0P722		B0P724		B0P726	
Location		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29	
Remarks						Duplicate										Duplicate					
Sample Date		07/06/98		7/6/98		7/6/98		7/6/98		7/7/98		7/7/98		7/7/98		7/7/98		7/7/98		7/7/98	
Inorganic	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Arsenic		2.5		2.6		2.8		2.6		3		4		3		3.3		2.9		7.2	
Barium		91.6		78.1		73.4		73.6		74.4		78.2		77.8		71.7		56.7		92.8	
Cadmium	2	0.44		0.15		0.2		0.15		0.18		0.16		0.2		0.2		2.2		0.32	
Chromium	2	5.6		8		8		7.3		8.2		8.4		8.5		8.2		12		4.6	
Lead	10	5		4.2		4.2		3.5		4		4.5		4.3		4.3		98.2		1.8	
Selenium	25	0.6		0.44		0.46		0.49		0.52		0.42	U	0.6		0.69		0.37	U	0.68	
Silver	20	0.11	U	0.11	U	0.12	U	0.11	U	0.1	U	0.11	U	0.11	U	0.11	U	1.4		0.09	U
Mercury	0.1	0.12		0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	0.05	U	0.05	U	1.7		0.02	U

010000

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 08/25/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9807L797

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	BOP708	Silver, Total	0.11 u	MG/KG	0.11	1.0
		Arsenic, Total	2.5	MG/KG	0.34	1.0
		Barium, Total	91.6	MG/KG	0.02	1.0
		Cadmium, Total	0.44	MG/KG	0.05	1.0
		Chromium, Total	5.6	MG/KG	0.11	1.0
		Mercury, Total	0.12	MG/KG	0.02	1.0
		Lead, Total	5.0	MG/KG	0.26	1.0
		Selenium, Total	0.60	MG/KG	0.41	1.0
-002	BOP710	Silver, Total	0.11 u	MG/KG	0.11	1.0
		Arsenic, Total	2.5	MG/KG	0.34	1.0
		Barium, Total	78.1	MG/KG	0.02	1.0
		Cadmium, Total	0.15	MG/KG	0.05	1.0
		Chromium, Total	8.0	MG/KG	0.11	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.2	MG/KG	0.26	1.0
		Selenium, Total	0.44	MG/KG	0.41	1.0
-003	BOP712	Silver, Total	0.12 u	MG/KG	0.12	1.0
		Arsenic, Total	2.8	MG/KG	0.35	1.0
		Barium, Total	73.4	MG/KG	0.02	1.0
		Cadmium, Total	0.20	MG/KG	0.05	1.0
		Chromium, Total	8.0	MG/KG	0.12	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.2	MG/KG	0.26	1.0
		Selenium, Total	0.46	MG/KG	0.42	1.0
-004	BOP714	Silver, Total	0.11 u	MG/KG	0.11	1.0
		Arsenic, Total	2.6	MG/KG	0.32	1.0
		Barium, Total	73.6	MG/KG	0.02	1.0
		Cadmium, Total	0.15	MG/KG	0.05	1.0
		Chromium, Total	7.3	MG/KG	0.11	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	3.5	MG/KG	0.24	1.0
		Selenium, Total	0.49	MG/KG	0.38	1.0

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9/21/98

Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 08/25/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9807L797

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-005	BOP716	Silver, Total	0.10 u	MG/KG	0.10	1.0
		Arsenic, Total	3.0	MG/KG	0.31	1.0
		Barium, Total	74.4	MG/KG	0.02	1.0
		Cadmium, Total	0.18	MG/KG	0.05	1.0
		Chromium, Total	8.2	MG/KG	0.10	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.0	MG/KG	0.24	1.0
		Selenium, Total	0.52	MG/KG	0.38	1.0
-006	BOP718	Silver, Total	0.11 u	MG/KG	0.11	1.0
		Arsenic, Total	4.0	MG/KG	0.34	1.0
		Barium, Total	78.2	MG/KG	0.02	1.0
		Cadmium, Total	0.16	MG/KG	0.05	1.0
		Chromium, Total	8.4	MG/KG	0.11	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	4.5	MG/KG	0.26	1.0
		Selenium, Total	0.42 u	MG/KG	0.42	1.0
-007	BOP720	Silver, Total	0.12 u	MG/KG	0.12	1.0
		Arsenic, Total	3.0	MG/KG	0.35	1.0
		Barium, Total	77.8	MG/KG	0.02	1.0
		Cadmium, Total	0.20	MG/KG	0.05	1.0
		Chromium, Total	8.5	MG/KG	0.12	1.0
		Mercury, Total	0.03	MG/KG	0.02	1.0
		Lead, Total	4.3	MG/KG	0.27	1.0
		Selenium, Total	0.60	MG/KG	0.43	1.0
-008	BOP722	Silver, Total	0.11 u	MG/KG	0.11	1.0
		Arsenic, Total	3.3	MG/KG	0.33	1.0
		Barium, Total	71.7	MG/KG	0.02	1.0
		Cadmium, Total	0.20	MG/KG	0.05	1.0
		Chromium, Total	8.2	MG/KG	0.11	1.0
		Mercury, Total	0.05	MG/KG	0.02	1.0
		Lead, Total	4.3	MG/KG	0.25	1.0
		Selenium, Total	0.69	MG/KG	0.41	1.0

RLM 9/21/98

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Recra LabNet - Lionville

INORGANICS DATA SUMMARY REPORT 08/25/98

CLIENT: TNU-HANFORD

RECRA LOT #: 9807L797

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

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
-009	BOP724	Silver, Total	1.4	MG/KG	0.10	1.0
		Arsenic, Total	2.9	MG/KG	0.30	1.0
		Barium, Total	56.7	MG/KG	0.02	1.0
		Cadmium, Total	2.2	MG/KG	0.05	1.0
		Chromium, Total	12.0	MG/KG	0.10	1.0
		Mercury, Total	1.7	MG/KG	0.02	1.0
		Lead, Total	98.2	MG/KG	0.23	1.0
		Selenium, Total	0.37 u	MG/KG	0.37	1.0
-010	BOP726	Silver, Total	0.09 u	MG/KG	0.09	1.0
		Arsenic, Total	7.2	MG/KG	0.28	1.0
		Barium, Total	92.8	MG/KG	0.02	1.0
		Cadmium, Total	0.32	MG/KG	0.04	1.0
		Chromium, Total	4.6	MG/KG	0.09	1.0
		Mercury, Total	0.02 u	MG/KG	0.02	1.0
		Lead, Total	1.8	MG/KG	0.21	1.0
		Selenium, Total	0.68	MG/KG	0.34	1.0

RLV 9/21/98

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD
RFW# : 9807L797
SDG/SAF# : H0164/B98-088

W.O.# : 10985-001-001-9999-00
Date Received: 07-10-98

SEP 1998
RECEIVED
Data
Log In

METALS CASE NARRATIVE

1. This narrative covers the analyses of 10 soil samples.

2. The samples were prepared and analyzed in accordance with methods checked on the attached glossary.

3. All analyses were performed within the required holding times.

4. The cooler temperature has been recorded on the Chain of Custody.

5. All Initial and Continuing Calibration Verifications (ICV/CCVs) were within control limits.

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. All matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the 75-125% control limits. Refer to the Inorganics Accuracy Report.

11. The duplicate analyses for 2 analytes were outside the 20% Relative Percent Difference (RPD) control limits. Refer to the Inorganics Precision Report.

The results presented in this report relate only to the analytical testing and conditions of the samples at receipt and during storage. All pages of this report are integral parts of the analytical data. Therefore, this report should only be reproduced in its entirety of 26 pages.

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

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

Chuck Stefanosky
Laboratory Director
Lionville Analytical Laboratory

8-25-99
Date

mld/m07-797

398-088-11

Collector: Robert Lamberg / DL Bomens	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: OTB 7-6-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

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POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89/90 - Total	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		

000017

Sample No	Matrix *	Sample Date	Sample Time										
B0P708	Soil	7-6-98	1117	X	X	X	X	X	X	X	X		B0P707
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Steve Nielsen P Nielsen	7/9/98 1400	Fedex	
Relinquished By: Jedley	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}

Note: Above indicated sample containers shipped to RECRA Lionville PA, other analytes shipped to Thermo Richmond CA DAS 7/9/98

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: Stoder	Title: Sample Custodian	Date Time: 7/10/98 10:00
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By: 4235 7951 3827	Date Time

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Collector: Robert Fahlberg / DL Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: 7-6-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)		1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha, Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89/90 -- Total Si	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		

Sample No.	Matrix *	Sample Date	Sample Time										
B0P710	Soil	7-6-98	1133	X	X	X	X	X	X	X	X	B0P709	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

000018

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	7/9/98 1440	Fed Ex	
Fed Ex			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped to RECRA Lionville, PA. Other analytes shipped to thermo, Richmond CA, DAS 7/9/98

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: [illegible]	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

... REQUEST | B98-088-13 | Page 1 of 1

Collector: Robert Fahlberg / DL Barnes	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: ~~Quantera Incorporated~~ 5TB 7-6-98 TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool R

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	10mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89/90 - Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		

Sample No.	Matrix *	Sample Date	Sample Time									
B0P712	Soil	7-6-98	1133	X	X	X	X	X	X	X	X	~~B0P711~~ B0P709
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98	DAS 7/9/98

000019

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	7/9/98 1414	[illegible]	
Jedea			

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) [Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver]

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to thermo Richmond 'A. DAS 7/9/98

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: Joder	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

ANALYSIS REQUEST

B98-088-14 | Page 1 of 1

Collector: Robert Lahlberg / DL Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL1381		Method of Shipment: Hand deliver
Shipped To: 7-8-98 ~~Chemtech Hunt Purnell~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89/90 - Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		
Sample No	Matrix *	Sample Date	Sample Time								
B0P714	Soil	7-6-98	1215	X	X	X	X	X	X	X	X
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98

Same on bottle 1146

0000020

B0P713

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	[illegible] 1442	Fed Ex	
Jeder			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) [Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver]

Note: Above indicated sample containers shipped to RECRA Lansville PA. Other analytes shipped to thermo Richmond CA. DAS 7/9/98

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: Jeder — Title: Sample Custodian — Date/Time: 7/10/98 10:27

FINAL SAMPLE DISPOSITION — Disposal Method: — Disposed By: — Date/Time:

Collector: Robert Lahlberg / D Bowers	Company Contact: Scott Petersen — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Data Turnaround: **15 Days**
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East	SAF No.: B98-088	
Ice Chest No.	Field Logbook No.: EL1381	Method of Shipment: Hand deliver	
Shipped To: KZB 7-2-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.	Bill of Lading/Air Bill No.	
Waste Designation: D002, D006, U133, and WT02		COA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium 89,90 -- Total Si	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		

000021

Sample No	Matrix *	Sample Date	Sample Time										
B0P716	Soil	7-7-98	0831	X	X	X	X	X	X	X	X	B0P715	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	7/9/98 1402	FedEx	
Jedex			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to thermoRichmond CA DAS 7/9/98

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
	Jodler	Sample Custodian	7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Collector: Robert Laddick / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Chemtech Inc/Spectrex~~	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002 D006 U133, and WT02			COA

Data Turnaround: 15 Days

ETR

POSSIBLE SAMPLE HAZARDS/REMARKS	Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
	Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
	No. of Container(s)	1	1	1	1	1	1	1	1		
Special Handling and/or Storage: Cool 4C	Volume	20ml	60ml	60ml	60ml	60ml	120ml	120ml	1000ml		
SAMPLE ANALYSIS		Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CVA)	Strontium-89/90 - Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		
Sample No.	Matrix *	Sample Date	Sample Time								
B0P718	Soil	7-7-98	0844	X	X	X	X	X	X	X	B0P717
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98		DAS 7/9/98	

0000022

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [illegible]	Date/Time: [illegible]	Received By: [illegible]	Date/Time:
Relinquished By: Fedex	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Superfrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to Thermo Richmond CA DAS 7/9/98

Matrix *

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

LABORATORY SECTION	Received By: Fedex	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

B98-088-17 Page 1 of 1

Collector: Robert Lahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: 15 Days

0012

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium 89/90 - Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		
Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium 89/90 - Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		
B0P720	Soil	7-7-98	0856	X	X	X	X	X	X	X	X	B0P719	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

0000028

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Kenneth Nelson - K Nelson 7/9/98	1440	Fed Ex	
Fedex			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) [Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver]

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to Thermo Richmond CA. DAS 7/9/98

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: Jaen	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

... ANALYSIS REQUEST | B98-088-18 | Page 1 of 1

Collector: Robert Fahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89 90 -- Total S	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		

000024

Sample No	Matrix *	Sample Date	Sample Time									
B0P722	Soil	7-7-98	0856	X	X	X	X	X	X	X	X	B0P721
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Agnes Nielsen / Nielsen	7/7/98 1412	Fed Ex	
Fedex			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to Thermo Richmond CA DAS 7/9/98

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: Joder	Title: Sample Custodian	Date/Time: 7/10/98 10:00
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Collector: Robert Faldberg / D Bowers	Company Contact: Scott Petersen — Telephone No.: 372-9574	Project Coordinator: TRENT SJ	Data Turnaround: **15 Days**
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East	SAF No.: B98-088	
Ice Chest No.	Field Logbook No.: EL 1381	Method of Shipment: Hand deliver	
Shipped To: 7-7-98 BDB ~~Quantera Incorporated~~ TMA	Offsite Property No.	Bill of Lading/Air Bill No.	
Waste Designation: D002, D006, U133, and WT02		COA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium - 89/90 - Total SI	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium 137 Cobalt-60)		
Sample No. / Matrix * / Sample Date / Sample Time										
B0P724 / Soil / 7-7-98 / 0920	X	X	X	X	X	X	X	X	B0P723	
	DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

000025

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date Time	Received By	Date Time
Ernest Nielsen / P. Nielsen	7/9/98 1400	Fed Ex	
Fed Ex			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Superfrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}

Note: Above indicated sample containers shipped to RECRA Lenville PA. Other analytes shipped to ThermoRichmond CA DAS 7/9/98

Matrix *

S	Soil
SL	Sediment
SO	Solid
SI	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: Jeder	Title: Sample Custodian	Date Time: 7/10/98 10:00
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date Time

SAMPLE ANALYSIS REQUEST

B98-088-20 | Page 1 of 1

Collector: Robert Ladberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL B 81		Method of Shipment: Hand deliver
Shipped To: 7-7-98 0920 TMA ~~Quanterra Incorporated~~	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

000026

SAMPLE ANALYSIS	Activity Scan	Gross Alpha, Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89,90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		
Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		

Sample No	Matrix *	Sample Date	Sample Time										
B0P726	Soil	7-7-98	0942	X	X	X	X	X	X	X	X	B0P725	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Karen Nelson / Pete Nelson	7/9/98 1400	Fedex	
Fedex			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) [Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver]

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to Thermo Richmond CA DAS 7/9/98

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: Fiorer	Title: Sample Custodian	Date/Time: 7/10/98 10:00
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: 214-A-29	DATA PACKAGE: H0164	
VALIDATOR: TLI	LAB: RLN	DATE: 9/18/98
CASE:	SDG: H0164	

ANALYSES PERFORMED

☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☒ SW-846/ICP	☐ SW-846/GFAA	☒ SW-846/Hg	☐ SW-846 Cyanide	☐	☐

SAMPLES/MATRIX BOP708, BOP710, BOP712, BOP714
BOP716, BOP718, BOP720, BOP722, BOP724
BOP724

Water

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: Barium Chromium + lead in blank
Bar - ok No qual req
Cr - ok
lead - ok

5. ACCURACY

Were spike samples analyzed? . . . . . Yes No N/A
Are spike sample recoveries acceptable? . . . . . Yes No N/A
Were laboratory control samples (LCS) analyzed? . . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A

Comments:

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A

Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A

Were ICP serial dilution samples analyzed? . . . . . Yes No N/A

Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A

Are field duplicate RPD values acceptable? . . . . . Yes No N/A

Are field split RPD values acceptable? . . . . . Yes No N/A

Comments:

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:

Date: 25 September 1998
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 216-A-29 Ditch - Soil
Subject: PCB - Data Package No. H0164-RLN (SDG No. H0164)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0164-RLN prepared by Recra LabNet (RLN). A list of the 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
B0P708	7/6/98	Soil	C	Pest/PCBs (8080)
B0P710	7/6/98	Soil	C	Pest/PCBs (8080)
B0P712	7/6/98	Soil	C	Pest/PCBs (8080)
B0P714	7/6/98	Soil	C	Pest/PCBs (8080)
B0P716	7/7/98	Soil	C	Pest/PCBs (8080)
B0P718	7/7/98	Soil	C	Pest/PCBs (8080)
B0P720	7/7/98	Soil	C	Pest/PCBs (8080)
B0P722	7/7/98	Soil	C	Pest/PCBs (8080)
B0P724	7/7/98	Soil	C	Pest/PCBs (8080)
B0P726	7/7/98	Soil	C	Pest/PCBs (8080)

Data validation was conducted in accordance with the BHI validation statement of work. 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 were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded by less than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detected sample results are qualified as estimates and flagged "J" and all nondetects are rejected and flagged "UR".

Holding times were met for all samples.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration greater than CRQL. If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than CRQL, the result is qualified as undetected and elevated to the CRQL.

All method blank target compound results were acceptable.

- **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 analyses are performed in duplicate using six compounds and must be within the established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Nondetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

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

Surrogate Recovery

The analysis of surrogate compounds provides a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the laboratory. When a surrogate compound recovery is outside the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Nondetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Nondetected compounds with surrogate recoveries above the upper control limit require no qualification.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples, results must be within RPD limits of $\pm 35\%$. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

No matrix spike/matrix spike duplicate RPD results were available.

Field Duplicates

Two field duplicate pairs (B0P710/B0P712 and B0P720/B0P722) were submitted for analysis. The sample duplicate pairs 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 CRQLs to ensure that laboratory detection levels meet the required criteria. The laboratory detection

limits were exceeded for all analytes and all samples, but under WHC guidelines no qualification is required.

- **Completeness**

  Data Package No. H0164-RLN (SDG No. H0164) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to the lack of a matrix spike and matrix spike duplicate analysis, all sample 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.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein 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. 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.

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: H0164	REVIEWER: TLI	DATE: 9/25/98	PAGE_1_OF_1_
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All	J	All	No MS/MSD analysis

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PESTICIDE/PCB ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																									
Laboratory: Recra LabNet																									
Case	SDG: H0164																								
Sample Number		B0P708		B0P710		B0P712		B0P714		B0P716		B0P718		B0P720		B0P722		B0P724		B0P726					
Location		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29					
Remarks						Duplicate										Duplicate									
Sample Date		7/6/98		7/6/98		7/6/98		7/6/98		7/7/98		7/7/98		7/7/98		7/7/98		7/7/98		7/7/98					
Pest/PCB	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Arochlor-1016	33	35	UJ	36	UJ	35	UJ	35	UJ	36	UJ	36	UJ	38	UJ	38	UJ	40	UJ	34	UJ				
Arochlor-1221	33	71	UJ	71	UJ	71	UJ	70	UJ	71	UJ	72	UJ	76	UJ	76	UJ	79	UJ	69	UJ				
Arochlor-1232	33	35	UJ	36	UJ	35	UJ	35	UJ	36	UJ	36	UJ	38	UJ	38	UJ	40	UJ	34	UJ				
Arochlor-1242	33	35	UJ	36	UJ	35	UJ	35	UJ	36	UJ	36	UJ	38	UJ	38	UJ	40	UJ	34	UJ				
Arochlor-1248	33	35	UJ	36	UJ	35	UJ	35	UJ	36	UJ	36	UJ	38	UJ	38	UJ	40	UJ	34	UJ				
Arochlor-1254	33	35	UJ	36	UJ	35	UJ	35	UJ	36	UJ	36	UJ	38	UJ	38	UJ	40	UJ	34	UJ				
Arochlor-1260	33	35	UJ	36	UJ	35	UJ	35	UJ	36	UJ	36	UJ	38	UJ	38	UJ	40	UJ	34	UJ				

000010

Recra LabNet - Lionville Laboratory

RW Batch Number: 9807L797 Client: TNU-HANFORD Page: 1

	Cust ID:	BOP708	BOP710	BOP712	BOP714	BOP716	BOP718
Sample Information	RFW#:	001	002	003	004	005	006
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	92 %	95 %	92 %	98 %	100 %	90 %
	Decachlorobiphenyl	109 %	108 %	107 %	105 %	114 %	108 %
Aroclor-1016		35 U J	36 U J	35 U J	35 U J	36 U J	36 U J
Aroclor-1221		71 U	71 U	71 U	70 U	71 U	72 U
Aroclor-1232		35 U	36 U	35 U	35 U	36 U	36 U
Aroclor-1242		35 U	36 U	35 U	35 U	36 U	36 U
Aroclor-1248		35 U	36 U	35 U	35 U	36 U	36 U
Aroclor-1254		35 U	36 U	35 U	35 U	36 U	36 U
Aroclor-1260		35 U	36 U	35 U	35 U	36 U	36 U

F004

000011

	Cust ID:	BOP720	BOP722	BOP724	BOP726	PBLKJR	PBLKJR BS
Sample Information	RFW#:	007	008	009	010	98LE1195-MB1	98LE1195-MB1
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate:	Tetrachloro-m-xylene	90 %	58 %	75 %	85 %	100 %	112 %
	Decachlorobiphenyl	103 %	66 %	104 %	100 %	121 %	120 %
Aroclor-1016		38 U J	38 U J	40 U J	34 U J	33 U	33 U
Aroclor-1221		76 U	76 U	79 U	69 U	67 U	67 U
Aroclor-1232		38 U	38 U	40 U	34 U	33 U	33 U
Aroclor-1242		38 U	38 U	40 U	34 U	33 U	33 U
Aroclor-1248		38 U	38 U	40 U	34 U	33 U	33 U
Aroclor-1254		38 U	38 U	40 U	34 U	33 U	75 %
Aroclor-1260		38 U	38 U	40 U	34 U	33 U	33 U

U= Analyzed, not detected. J= Present below detection limit. B= Present in blank. NR= Not reported. NS= Not spiked.
%= Percent recovery. D= Diluted out. I= Interference. NA= Not Applicable. *= Outside of EPA CLP QC

7/21/98

05-10-98

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

RECRA LabNet
a division of Recra Environmental, Inc.
Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client : TNU-HANFORD
RFW# : 9807L797
SDG/SAF: H0164/B98-088

W.O.# : 10985-001-001-9999-00
Date Received : 07-25-98

PCB

The set of samples consisted of ten (10) soil samples collected on 07-06,07-98.

The samples and their associated QC samples were extracted on 07-14-98 and analyzed on 07-24,25-98 according to Recra OPs based on SW846, 3rd Edition, Method 3540 and Method 8081.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis were met.
3. The samples and their associated QC samples received a sulfuric acid cleanup and a sulfur cleanup.
4. The method blank was below the reporting limits for all target compounds.
5. All surrogate recoveries were within acceptance criteria.
6. The blank spike recovery was within acceptance criteria.
7. All initial calibrations associated with this data set were within acceptance criteria.
8. All continuing calibration standards analyzed prior to sample extracts were within acceptance criteria.

SEP 1998
RECEIVED
Data
Log In

For Chuck Stefanosky
Laboratory Director
Lionville Analytical Laboratory

08-18-98
Date

jeh/pcb/07-797.pcb

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 16 pages.

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

Collector: Robert Lindberg / DL Bowens	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: ~~Handling Not Appropriate~~ DTB 7-6-98 TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

1 of 1

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

SAMPLE ANALYSIS													
Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
	Activity Scan	Gross Alpha, Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium - 89/90 - Total	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		
Sample No.	Matrix *	Sample Date	Sample Time										
B0P708	Soil	7-6-98	1117	X	X	X	X	X	X	X	X	BOP707	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

000014

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Diana Nielsen / P Nielsen	7/8/98 1400	Fedex	
Relinquished By: Fedex	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped to RCCRA Louisville Pd, Other analytes shipped to thermo Richmond CA DAS 7/9/98

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: Stocker	Title: Sample Custodian	Date/Time: 7/10/98 10:00
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By: 4255 7951 3827	Date/Time

4 of 5

Collector: Robert Fahlberg / DL Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: 7-6-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)		1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium - 89/90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		

000015

Sample No	Matrix *	Sample Date	Sample Time										
B0P710	Soil	7-6-98	1133	X	X	X	X	X	X	X	X	B0P709	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	7/9/98 1400	Fed Ex	
Fed Ex			

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) [Arsenic, Barium, Cadmium, Chromium, Lead Selenium, Silver]

Note: Above indicated sample containers shipped to RECRA Liouville, PA. Other analytes shipped to thermo, Richmond JA, DAS 7/9/98

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: [illegible]	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

B98-088-13 Page 1 of 1

Collector: Robert Laddusaw / DL Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: ~~Chemtech Inc/Pruch~~ TMA 7-6-98	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

SAMPLE ANALYSIS

Sample No	Matrix *	Sample Date	Sample Time	Activity Scan	Gross Alpha, Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89/90 - Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		
Preservation				None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container				P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)				1	1	1	1	1	1	1	1		
Volume				20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
B0P712	Soil	7-6-98	1133	X	X	X	X	X	X	X	X	~~B0P711~~ B0P709	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98	DAS 7/9/98	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
DL Bowers / R Pickett	7/9/98 1414	Felcy	
Relinquished By: Jedeu	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to thermo Richmond VA. DAS 7/9/98

Matrix *

S	Soil
SL	Sediment
SO	Solid
SI	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: Stoller	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

000016

~~B0P711~~ B0P709

DAS 7/9/98

~~B0P711~~

... ANALYSIS REQUEST | B98-088-14 | Page 1 of 1

Collector: Robert Lahlberg / DL Bowen	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL1381		Method of Shipment: Hand deliver
Shipped To: ~~Quanterra Incorporated~~ TMA 7-6-98	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

SAMPLE ANALYSIS

time on bottle 1146

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20ml	60ml	60ml	60ml	60ml	120ml	120ml	1000ml		
	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89 90 - Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		

Sample No	Matrix *	Sample Date	Sample Time										
B0P714	Soil	7-6-98	1215	X	X	X	X	X	X	X	X	B0P713	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

000017

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [signature]	Date/Time: 7/9/98 1400	Received By: Fed Ex	Date/Time
Relinquished By: Jedex	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to thermo Richmond CA. DAS 7/9/98

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: [signature]	Title: Sample Custodian	Date/Time: 7/10/98 10:00
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Collector: Robert Fahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL1381		Method of Shipment: Hand deliver
Shipped To: KZB 7-2-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02.			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium 89,90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium 137 Cobalt 60)		

000018

Sample No.	Matrix *	Sample Date	Sample Time										
B0P716	Soil	7-7-98	0831	X	X	X	X	X	X	X	X	B0P715	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
Bruce Nielsen R Nielsen	7/9/98 1402	FedEx	
Fedex			

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) [Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver]

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to thermoRichmond CA DAS 7/9/98

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: Soler	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Collector: Robert Laidlaw / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 BD ~~Quantum Incorporated~~	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89/90 - Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		

000019

Sample No	Matrix *	Sample Date	Sample Time										
B0P718	Soil	7-7-98	0844	X	X	X	X	X	X	X	X	B0P717	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	[illegible]	[illegible]	
Fedex			

Sign/Print Names

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) [Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver]

Note: Above indicated sample containers shipped to RECRA Lionville PA - Other analytes Shipped to Thermo Richmond CA DAS 7/9/98

Matrix *

S	Soil
SL	Sediment
SO	Solid
SI	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: Stoder	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

5012

B98-088-17 Page 1 of 1

Collector: Robert Lahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 8AM TMA ~~Quanterra Incorporated~~	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02.			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89/90 - Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		
Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		

Sample No	Matrix *	Sample Date	Sample Time										
B0P720	Soil	7-7-98	0856	X	X	X	X	X	X	X	X	B0P719	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

0000020

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
Nancy Miller - P Nelson	7/7/98 1460	Fed Ex	
Fedex			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) [Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver]

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to Thermo Richmond CA. DAS 7/9/98

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: Jaden	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

... ANALYSIS REQUEST | B98-088-18 | Page 1 of 1

Collector: Robert Lahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Quantera Incorporated~~ BTD TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha, Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89 90 -- Total	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		

000021

Sample No	Matrix *	Sample Date	Sample Time										
B0P722	Soil	7-7-98	0856	X	X	X	X	X	X	X	X	B0P721	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Renee Nielsen / Nielsen	Date/Time: 7/9/98 1412	Received By: [illegible]	Date/Time
Relinquished By: Fedex	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to Thermo Richmond QA DAS 7/9/98

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: Joder	Title: Sample Custodian	Date/Time: 7/10/98 10:00
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Collector: Robert Lahberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.:	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 BDB ~~Chemical Incompatible~~ TMA	Offsite Property No.:		Bill of Lading/Air Bill No.:
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

SAMPLE ANALYSIS

Sample No	Matrix *	Sample Date	Sample Time	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CVA)	Strontium - 8990 - (Total S)	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		
Preservation				None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container				aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)				1	1	1	1	1	1	1	1		
Volume				60mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
B0P724	Soil	7-7-98	0920	X	X	X	X	X	X	X	X	B0P723	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

2220000

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Fed Ex / P. Nipkin	7/9/98 14:00	Fed Ex	
Fed Ex			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) [Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver]

Note: Above indicated sample containers shipped to RECRA Lewiville PA. Other analytes shipped to ThermoRichmond CA DAS 7/9/98

Matrix *

S	Soil
SL	Sediment
SO	Solid
SJ	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: [illegible]	Title: Sample Custodian	Date/Time: 7/10/98 10:[illegible]
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

SAMPLE ANALYSIS REQUEST

B98-088-20 | Page 1 of 1

Collector: Robert Fahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: ELB 81		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium - 89,90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		
Sample No / Matrix * / Sample Date / Sample Time										
B0P726 / Soil / 7-7-98 / 0942	X	X	X	X	X	X	X	X	B0P725	
	DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

000023

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [signature]	Date/Time: 7/9/98	Received By: Fedex	Date/Time:
Relinquished By: Fedex	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to Thermo Richmond CA DAS 7/9/98

Matrix *
- S = Soil
- SE = Sediment
- SO = Solid
- SI = 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: [signature]	Title: Sample Custodian	Date/Time: 7/10/98 10:00
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 216-A-29	DATA PACKAGE: H0164	
VALIDATOR: TCI	LAB: RLN	DATE: 9/19/98
CASE:	SDG: H0164	

ANALYSES PERFORMED					
☐ CLP3/90	☐ SW-846 8080	☑ SW-846 8081	☐	☐	☐

SAMPLES/MATRIX

BOP708	BOP710	BOP712	BOP714	BOP716
BOP718	BOP720	BOP722	BOP724	BOP726
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:

000025

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

Are DDT retention times acceptable . . . . . Yes No (N/A)

Are calibration standard retention times acceptable? . . . . . Yes No N/A

Are DDT and endrin breakdowns acceptable? . . . . . Yes No N/A

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are DBC retention times acceptable? . . . . . Yes No N/A

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Comments: _____

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

Are EVAL standard calibration factors and %RSD values acceptable? . . . . . Yes No N/A

Are quantitation column calibration factor %RSD values acceptable? . . . . . Yes No N/A

Were the analytical sequence requirements met? . . . . . Yes No N/A

Are continuing calibration %D values acceptable? . . . . . Yes No N/A

Comments: _____

3.3 INSTRUMENT PERFORMANCE AND INITIAL CALIBRATION (3/90 SOW)

Was the initial calibration sequence performed? . . . . . Yes No N/A

Was the resolution acceptable in the resolution check mix? . . Yes No N/A

Is resolution acceptable in the PEM, INDA and INDB? . . . . . Yes No N/A

Are DDT and Endrin breakdowns acceptable? . . . . . Yes No N/A

Are retention times in PEMs and calibration mixes acceptable? . Yes No N/A

Are RPD values in the PEMs acceptable? . . . . . Yes No N/A

Are %RSD values acceptable? . . . . . Yes No N/A

Comments: _____

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Were the analytical sequence requirements met? . . . . . Yes No N/A

Is resolution acceptable in the PEMs? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Are retention times acceptable in the PEMs, INDA and INDB mixes? . . . . . Yes No N/A

Are RPD values in the PEMs acceptable? . . . . . Yes No N/A

Are the DDT and endrin breakdowns acceptable? . . . . . Yes No N/A

Was GPC cleanup performed? . . . . . Yes No N/A

Is the GPC calibration check acceptable? . . . . . Yes No N/A

Was Florisil cleanup performed? . . . . . Yes No N/A

Is the Florisil performance check acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory 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:

5. ACCURACY

Were surrogates analyzed? . . . . . Yes No N/A

Are surrogate recoveries acceptable? . . . . . Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . Yes No N/A

Were LCS samples analyzed? . . . . . Yes No N/A

Are LCS results acceptable? . . . . . Yes No N/A

Comments: NO MS/MSD J/UJ all

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD values acceptable? . . . . . Yes No N/A

Are laboratory duplicate results 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. SYSTEM PERFORMANCE

Is chromatographic performance acceptable? . . . . . Yes No N/A

Are positive results resolved acceptably? . . . . . Yes No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Do results meet the CRQLs? . . . . . Yes No N/A

Comments: all over CRQL

Date: 25 September 1998
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 216-A-29 Ditch - Soil
Subject: Semivolatiles - Data Package No. H0164-RLN (SDG No. H0164)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0164-RLN prepared by Recra LabNet (RLN). A list of the 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
B0P708	7/6/98	Soil	C	Semi-Volatiles (8270)
B0P710	7/6/98	Soil	C	Semi-Volatiles (8270)
B0P712	7/6/98	Soil	C	Semi-Volatiles (8270)
B0P714	7/6/98	Soil	C	Semi-Volatiles (8270)
B0P716	7/7/98	Soil	C	Semi-Volatiles (8270)
B0P718	7/7/98	Soil	C	Semi-Volatiles (8270)
B0P720	7/7/98	Soil	C	Semi-Volatiles (8270)
B0P722	7/7/98	Soil	C	Semi-Volatiles (8270)
B0P724	7/7/98	Soil	C	Semi-Volatiles (8270)
B0P726	7/7/98	Soil	C	Semi-Volatiles (8270)

Data validation was conducted in accordance with the BHI validation statement of work. 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 were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

If holding times are exceeded, but not by greater than two times the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by greater than two times the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times were met for all samples.

- **Blanks**

Method blank analyses are conducted to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at less than five times the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at less than ten times the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is less than the CRQL and is less than five times (or less than ten times for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U".

All method blank results were acceptable.

- **Accuracy**

Matrix Spike/Matrix Spike Duplicate Recoveries

Matrix spike/matrix spike duplicate 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/matrix spike duplicate analyses are performed in duplicate using five compounds for which percent recoveries must be within established laboratory quality control limits. If spike

recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

The MS/MSD recoveries for 4-nitrophenol and pentachlorophenol were outside QC limits but under WHC guidelines, no qualification is required.

All other matrix spike recovery results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. If two surrogates of the same class of compounds (base/neutral or acid) are out of control limits, all associated sample results greater than the CRQL are qualified as estimates and flagged "J". Sample results less than the CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results less than the CRQL with recoveries above the upper control limit require no qualification. If a surrogate recovery is less than 10%, detects are qualified as estimates and flagged "J" and nondetects are rejected and flagged "UR".

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For samples analyzed using SW-846 protocol, results must be within RPD limits of +/-20% for water samples and +/- 35% for solid samples. If RPD values are out of specification and the sample concentration is less than five times the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is greater than five times the spike concentration, no qualification is required.

All MS/MSD precision results were acceptable.

Field Duplicates

Two field duplicate pairs (B0P710/B0P712 and B0P720/B0P722) was submitted for analysis. The sample duplicate pairs were compared using the same criteria as for a laboratory duplicate. The RPD for bis(2-ethylhexyl)phthalate was outside QC limits in sample duplicate pair B0P720/B0P722. Under WHC guidelines, no qualification is required. All other field duplicate results were acceptable.

- **Analytical Detection Levels**

Reported analytical detection levels are compared against CRQLs to ensure that laboratory detection levels meet the required criteria. The IDLs for all analytes exceeded the CRDLs. Under the BHI validation SOW, no qualification is required.

- **Completeness**

Data package No. H0164 (SDG No. H0164) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the 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 same 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. 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.

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 usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: H0164	REVIEWER: TLI	DATE: 9/25/98	PAGE 1 OF 1
COMMENTS: No qualifiers assigned			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMIVOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																					
Laboratory: RECRA LabNet																					
Case:	SDG: H0164																				
Sample Number		B0P708		B0P710		B0P712		B0P714		B0P716		B0P718		B0P720		B0P722		B0P724		B0P726	
Location		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29	
Remarks						Duplicate										Duplicate					
Sample Date		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98	
Extraction Date		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98	
Analysis Date		8/23/98		8/22/98		8/22/98		8/22/98		8/23/98		8/23/98		8/22/98		8/23/98		8/23/98		8/23/98	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
bis(2-Chloroethyl)ether	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2-Chlorophenol	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
1,3-Dichlorobenzene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
1,4-Dichlorobenzene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
1,2-Dichlorobenzene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2-Methylphenol	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2,2'-oxybis(1-Chloropropane)	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
4-Methylphenol	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
N-Nitroso-di-n-propylamine	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Hexachloroethane	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Nitrobenzene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Isophorone	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2-Nitrophenol	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2,4-Dimethylphenol	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
bis(2-Chloroethoxy)methane	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2,4-Dichlorophenol	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
1,2,4-Trichlorobenzene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Naphthalene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
4-Chloroaniline	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Hexachlorobutadiene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
4-Chloro-3-methylphenol	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2-Methylnaphthalene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Hexachlorocyclopentadiene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2,4,6-Trichlorophenol	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2,4,5-Trichlorophenol	25	880	U	890	U	880	U	880	U	900	U	900	U	950	U	940	U	990	U	860	U
2-Chloronaphthalene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2-Nitroaniline	800	880	U	890	U	880	U	880	U	900	U	900	U	950	U	940	U	990	U	860	U
Dimethylphthalate	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Acenaphthylene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2,6-Dinitrotoluene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U

000010

SEMIVOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (UG/KG)

Project: BECHTEL-HANFORD																					
Laboratory: RECRA LabNet																					
Case:	SDG: H0164																				
Sample Number		B0P708		B0P710		B0P712		B0P714		B0P716		B0P718		B0P720		B0P722		B0P724		B0P726	
Location		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29	
Remarks						Duplicate										Duplicate					
Sample Date		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98		7/6/98	
Extraction Date		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98		7/20/98	
Analysis Date		8/23/98		8/22/98		8/22/98		8/22/98		8/23/98		8/23/98		8/22/98		8/23/98		8/23/98		8/23/98	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	800	880	U	890	U	880	U	880	U	900	U	900	U	950	U	940	U	990	U	860	U
Acenaphthene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2,4-Dinitrophenol	800	880	U	890	U	880	U	880	U	900	U	900	U	950	U	940	U	990	U	860	U
4-Nitrophenol	800	880	U	890	U	880	U	880	U	900	U	900	U	950	U	940	U	990	U	860	U
Dibenzofuran	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
2,4-Dinitrotoluene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Diethylphthalate	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
4-Chlorophenyl-phenyl ether	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Fluorene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
4-Nitroaniline	800	880	U	890	U	880	U	880	U	900	U	900	U	950	U	940	U	990	U	860	U
4,6-Dinitro-2-methylphenol	800	880	U	890	U	880	U	880	U	900	U	900	U	950	U	940	U	990	U	860	U
N-Nitrosodiphenylamine	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
4-Bromophenyl-phenylether	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Hexachlorobenzene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Pentachlorophenol	800	880	U	890	U	880	U	880	U	900	U	900	U	950	U	940	U	990	U	860	U
Phenanthrene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Anthracene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Carbazole	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Di-n-butylphthalate	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Fluoranthene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Pyrene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Butylbenzylphthalate	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
3,3'-Dichlorobenzidine	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Benzo(a)anthracene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Chrysene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
bis(2-Ethylhexyl)phthalate	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	19	U	400	U	52	U
Di-n-octylphthalate	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Benzo(b)fluoranthene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Benzo(k)fluoranthene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Benzo(a)pyrene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Indeno(1,2,3-cd)pyrene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Dibenz(a,h)anthracene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U
Benzo(g,h,i)perylene	330	350	U	360	U	350	U	350	U	360	U	360	U	380	U	380	U	400	U	340	U

RSN Batch Number: 9807L797 Client: TNU-HANFORD Work Order: [illegible] Page 2b

Lab ID:	BCP716		BCP718		BCP720		BCP722		BCP724		BCP726	
RFW#:	005		006		007		008		009		010	
2-Chloronaphthalene	360	U	360	U	380	U	380	U	400	U	340	U
2-Nitroaniline	900	U	900	U	950	U	940	U	990	U	860	U
Dimethylphthalate	360	U	360	U	380	U	380	U	400	U	340	U
Acenaphthylene	360	U	360	U	380	U	380	U	400	U	340	U
2,6-Dinitrotoluene	360	U	360	U	380	U	380	U	400	U	340	U
3-Nitroaniline	900	U	900	U	950	U	940	U	990	U	860	U
Acenaphthene	360	U	360	U	380	U	380	U	400	U	340	U
2,4-Dinitrophenol	900	U	900	U	950	U	940	U	990	U	860	U
4-Nitrophenol	900	U	900	U	950	U	940	U	990	U	860	U
Dibenzofuran	360	U	360	U	380	U	380	U	400	U	340	U
2,4-Dinitrotoluene	360	U	360	U	380	U	380	U	400	U	340	U
Diethylphthalate	360	U	360	U	380	U	380	U	400	U	340	U
4-Chlorophenyl-phenylether	360	U	360	U	380	U	380	U	400	U	340	U
Fluorene	360	U	360	U	380	U	380	U	400	U	340	U
4-Nitroaniline	900	U	900	U	950	U	940	U	990	U	860	U
4,6-Dinitro-2-methylphenol	900	U	900	U	950	U	940	U	990	U	860	U
N-Nitrosodiphenylamine (1)	360	U	360	U	380	U	380	U	400	U	340	U
4-Bromophenyl-phenylether	360	U	360	U	380	U	380	U	400	U	340	U
Hexachlorobenzene	360	U	360	U	380	U	380	U	400	U	340	U
Pentachlorophenol	900	U	900	U	950	U	940	U	990	U	860	U
Phenanthrene	360	U	360	U	380	U	380	U	400	U	340	U
Anthracene	360	U	360	U	380	U	380	U	400	U	340	U
Carbazole	360	U	360	U	380	U	380	U	400	U	340	U
Di-n-butylphthalate	360	U	360	U	380	U	380	U	400	U	340	U
Fluoranthene	360	U	360	U	380	U	380	U	400	U	340	U
Pyrene	360	U	360	U	380	U	380	U	400	U	340	U
Butylbenzylphthalate	360	U	360	U	380	U	380	U	400	U	340	U
3,3'-Dichlorobenzidine	360	U	360	U	380	U	380	U	400	U	340	U
Benzo(a)anthracene	360	U	360	U	380	U	380	U	400	U	340	U
Chrysene	360	U	360	U	380	U	380	U	400	U	340	U
bis(2-Ethylhexyl)phthalate	360	U	360	U	380	U	19	J	400	U	52	J
Di-n-octyl phthalate	360	U	360	U	380	U	380	U	400	U	340	U
Benzo(b)fluoranthene	360	U	360	U	380	U	380	U	400	U	340	U
Benzo(k)fluoranthene	360	U	360	U	380	U	380	U	400	U	340	U
Benzo(a)pyrene	360	U	360	U	380	U	380	U	400	U	340	U
Indeno(1,2,3-cd)pyrene	360	U	360	U	380	U	380	U	400	U	340	U
Dibenz(a,h)anthracene	360	U	360	U	380	U	380	U	400	U	340	U
Benzo(g,h,i)perylene	360	U	360	U	380	U	380	U	400	U	340	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

000012

9/21/98

Recra LabNet - Lionville Laboratory

Semivolatiles by GC-MS, HPL Lion

RFW Batch Number: 9807L797 Client: TNU-HANFORD Work Order: 10385001001 Page: 2a

	Cust ID:	BOP716	BOP718	BOP720	BOP722	BOP724	BOP726
Sample Information	RFW#:	005	006	007	008	009	010
	Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG	UG/KG
Surrogate Recovery	Nitrobenzene-d5	76 %	70 %	70 %	87 %	80 %	85 %
	2-Fluorobiphenyl	72 %	66 %	79 %	81 %	74 %	80 %
	Terphenyl-d14	69 %	60 %	74 %	82 %	72 %	78 %
	Phenol-d5	70 %	74 %	73 %	81 %	70 %	75 %
	2-Fluorophenol	64 %	64 %	71 %	79 %	68 %	61 %
	2,4,6-Tribromophenol	73 %	70 %	81 %	119 %	83 %	61 %
		fl	fl	fl	fl	fl	fl
Phenol		360 U	360 U	380 U	380 U	400 U	340 U
bis(2-Chloroethyl)ether		360 U	360 U	380 U	380 U	400 U	340 U
2-Chlorophenol		360 U	360 U	380 U	380 U	400 U	340 U
1,3-Dichlorobenzene		360 U	360 U	380 U	380 U	400 U	340 U
1,4-Dichlorobenzene		360 U	360 U	380 U	380 U	400 U	340 U
1,2-Dichlorobenzene		360 U	360 U	380 U	380 U	400 U	340 U
2-Methylphenol		360 U	360 U	380 U	380 U	400 U	340 U
2,2'-oxybis(1-Chloropropane)		360 U	360 U	380 U	380 U	400 U	340 U
4-Methylphenol		360 U	360 U	380 U	380 U	400 U	340 U
N-Nitroso-di-n-propylamine		360 U	360 U	380 U	380 U	400 U	340 U
Hexachloroethane		360 U	360 U	380 U	380 U	400 U	340 U
Nitrobenzene		360 U	360 U	380 U	380 U	400 U	340 U
Isophorone		360 U	360 U	380 U	380 U	400 U	340 U
2-Nitrophenol		360 U	360 U	380 U	380 U	400 U	340 U
2,4-Dimethylphenol		360 U	360 U	380 U	380 U	400 U	340 U
bis(2-Chloroethoxy)methane		360 U	360 U	380 U	380 U	400 U	340 U
2,4-Dichlorophenol		360 U	360 U	380 U	380 U	400 U	340 U
1,2,4-Trichlorobenzene		360 U	360 U	380 U	380 U	400 U	340 U
Naphthalene		360 U	360 U	380 U	380 U	400 U	340 U
4-Chloroaniline		360 U	360 U	380 U	380 U	400 U	340 U
Hexachlorobutadiene		360 U	360 U	380 U	380 U	400 U	340 U
4-Chloro-3-methylphenol		360 U	360 U	380 U	380 U	400 U	340 U
2-Methylnaphthalene		360 U	360 U	380 U	380 U	400 U	340 U
Hexachlorocyclopentadiene		360 U	360 U	380 U	380 U	400 U	340 U
2,4,6-Trichlorophenol		360 U	360 U	380 U	380 U	400 U	340 U
2,4,5-Trichlorophenol		900 U	900 U	950 U	940 U	990 U	860 U

*= Outside of EPA CLP QC limits.

000013

9/21/

Sample ID:	BOP708		BOP708		BOP708		BOP710		BOP712		BOP714	
RFW#:	001		001 MS		001 MSD		002		003		004	
2-Chloronaphthalene	350	U	350	U	350	U	360	U	350	U	350	U
2-Nitroaniline	880	U	880	U	880	U	890	U	880	U	880	U
Dimethylphthalate	350	U	350	U	350	U	360	U	350	U	350	U
Acenaphthylene	350	U	350	U	350	U	360	U	350	U	350	U
2,6-Dinitrotoluene	350	U	350	U	350	U	360	U	350	U	350	U
3-Nitroaniline	880	U	880	U	880	U	890	U	880	U	880	U
Acenaphthene	350	U	81	%	77	%	360	U	350	U	350	U
2,4-Dinitrophenol	880	U	880	U	880	U	890	U	880	U	880	U
4-Nitrophenol	880	U	148 *	%	151 *	%	890	U	880	U	880	U
Dibenzofuran	350	U	350	U	350	U	360	U	350	U	350	U
2,4-Dinitrotoluene	350	U	82	%	83	%	360	U	350	U	350	U
Diethylphthalate	350	U	350	U	350	U	360	U	350	U	350	U
4-Chlorophenyl-phenylether	350	U	350	U	350	U	360	U	350	U	350	U
Fluorene	350	U	350	U	350	U	360	U	350	U	350	U
4-Nitroaniline	880	U	880	U	880	U	890	U	880	U	880	U
4,6-Dinitro-2-methylphenol	880	U	880	U	880	U	890	U	880	U	880	U
N-Nitrosodiphenylamine (1)	350	U	350	U	350	U	360	U	350	U	350	U
4-Bromophenyl-phenylether	350	U	350	U	350	U	360	U	350	U	350	U
Hexachlorobenzene	350	U	350	U	350	U	360	U	350	U	350	U
Pentachlorophenol	880	U	121 *	%	113 *	%	890	U	880	U	880	U
Phenanthrene	350	U	350	U	350	U	360	U	350	U	350	U
Anthracene	350	U	350	U	350	U	360	U	350	U	350	U
Carbazole	350	U	350	U	350	U	360	U	350	U	350	U
Di-n-butylphthalate	350	U	350	U	350	U	360	U	350	U	350	U
Fluoranthene	350	U	350	U	350	U	360	U	350	U	350	U
Pyrene	350	U	87	%	75	%	360	U	350	U	350	U
Butylbenzylphthalate	350	U	350	U	350	U	360	U	350	U	350	U
3,3'-Dichlorobenzidine	350	U	350	U	350	U	360	U	350	U	350	U
Benzo(a)anthracene	350	U	350	U	350	U	360	U	350	U	350	U
Chrysene	350	U	350	U	350	U	360	U	350	U	350	U
bis(2-Ethylhexyl)phthalate	350	U	350	U	43	J	360	U	350	U	350	U
Di-n-octyl phthalate	350	U	350	U	350	U	360	U	350	U	350	U
Benzo(b)fluoranthene	350	U	350	U	350	U	360	U	350	U	350	U
Benzo(k)fluoranthene	350	U	350	U	350	U	360	U	350	U	350	U
Benzo(a)pyrene	350	U	350	U	350	U	360	U	350	U	350	U
Indeno(1,2,3-cd)pyrene	350	U	350	U	350	U	360	U	350	U	350	U
Dibenz(a,h)anthracene	350	U	350	U	350	U	360	U	350	U	350	U
Benzo(g,h,i)perylene	350	U	350	U	350	U	360	U	350	U	350	U

(1) - Cannot be separated from Diphenylamine. *= Outside of EPA CLP QC limits.

000014

Recra LabNet - Lionville Laboratory

Semivolatiles by GC/MS, HSL List

RFW Batch Number: 9807L797 Client: TNU-HANFORD Work Order: 10985001001 Page: 1a

	Cust ID:	BOP708		BOP708		BOP708		BOP710		BOP712		BOP714	
Sample Information	RFW#:	001		001 MS		001 MSD		002		003		004	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	UG/KG		UG/KG		UG/KG		UG/KG		UG/KG		UG/KG	
Surrogate Recovery	Nitrobenzene-d5	92	%	82	%	83	%	78	%	72	%	77	%
	2-Fluorobiphenyl	84	%	85	%	77	%	74	%	74	%	78	%
	Terphenyl-d14	80	%	81	%	74	%	62	%	60	%	74	%
	Phenol-d5	82	%	82	%	79	%	75	%	73	%	77	%
	2-Fluorophenol	72	%	75	%	74	%	66	%	65	%	73	%
	2,4,6-Tribromophenol	98	%	77	%	84	%	69	%	79	%	81	%
Phenol		350	U	77	%	80	%	360	U	350	U	350	U
bis(2-Chloroethyl)ether		350	U	350	U	350	U	360	U	350	U	350	U
2-Chlorophenol		350	U	74	%	77	%	360	U	350	U	350	U
1,3-Dichlorobenzene		350	U	350	U	350	U	360	U	350	U	350	U
1,4-Dichlorobenzene		350	U	73	%	75	%	360	U	350	U	350	U
1,2-Dichlorobenzene		350	U	350	U	350	U	360	U	350	U	350	U
2-Methylphenol		350	U	350	U	350	U	360	U	350	U	350	U
2,2'-oxybis(1-Chloropropane)		350	U	350	U	350	U	360	U	350	U	350	U
4-Methylphenol		350	U	350	U	350	U	360	U	350	U	350	U
N-Nitroso-di-n-propylamine		350	U	89	%	88	%	360	U	350	U	350	U
Hexachloroethane		350	U	350	U	350	U	360	U	350	U	350	U
Nitrobenzene		350	U	350	U	350	U	360	U	350	U	350	U
Isophorone		350	U	350	U	350	U	360	U	350	U	350	U
2-Nitrophenol		350	U	350	U	350	U	360	U	350	U	350	U
2,4-Dimethylphenol		350	U	350	U	350	U	360	U	350	U	350	U
bis(2-Chloroethoxy)methane		350	U	350	U	350	U	360	U	350	U	350	U
2,4-Dichlorophenol		350	U	350	U	350	U	360	U	350	U	350	U
1,2,4-Trichlorobenzene		350	U	77	%	80	%	360	U	350	U	350	U
Naphthalene		350	U	350	U	350	U	360	U	350	U	350	U
4-Chloroaniline		350	U	350	U	350	U	360	U	350	U	350	U
Hexachlorobutadiene		350	U	350	U	350	U	360	U	350	U	350	U
4-Chloro-3-methylphenol		350	U	85	%	84	%	360	U	350	U	350	U
2-Methylnaphthalene		350	U	350	U	350	U	360	U	350	U	350	U
Hexachlorocyclopentadiene		350	U	350	U	350	U	360	U	350	U	350	U
2,4,6-Trichlorophenol		350	U	350	U	350	U	360	U	350	U	350	U
2,4,5-Trichlorophenol		880	U	880	U	880	U	890	U	880	U	880	U

*= Outside of EPA CLP QC limits.

000015

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

RECRA LabNet

a division of Recra Environmental, Inc.

Virtual Laboratories Everywhere

Recra LabNet Philadelphia
Analytical Report

Client: TNU HANFORD
RFW #: 9807L797
SDG/SAF #: H0164/B98-088

W.O. #: 10985-001-001-9999-00
Date Received: 07-10-98

SEMIVOLATILE

The set of samples consisted of ten (10) soil samples collected on 07-06,07-98.

The samples and their associated QC samples were extracted on 07-20-98 and analyzed according to criteria set forth in SW 846 Method 8270 for Semivolatile target compounds on 08-22,23,25-98.

The following is a summary of the QC results accompanying the sample results and a description of any problems encountered during their analyses:

1. The cooler temperature upon receipt has been recorded on the chain-of-custody.
2. All required holding times for extraction and analysis were met.
3. Non-target compounds were detected in these samples.
4. All surrogate recoveries were within EPA QC limits.
5. All blank spike recoveries were within EPA QC limits.
6. Four (4) of twenty-two (22) matrix spike recoveries were within EPA QC limits.

SEP 1998
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Data
Log In

for Chuck Stefanosky
Laboratory Director
Lionville Analytical Laboratory

9-9-98
Date

000017

mmz/bna 07-797b.cn

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 32 pages.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-20 | Page 1 of 1

Collector: Robert Faulkner / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: ELD 81		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

0220

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20ml	60ml	60ml	60ml	60ml	120ml	120ml	1000ml		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha, Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium - 89/90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		

000018

Sample No	Matrix *	Sample Date	Sample Time										
B0P726	Soil	7-7-98	0942	X	X	X	X	X	X	X	X	B0P725	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [signature]	Date/Time: 7/9/98 1400	Received By: Fedex	Date/Time
Relinquished By: Fedex	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to Thermo Richmond CA DAS 7/9/98

Matrix *

S	Soil
SI	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: [signature]	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

... ANALYSIS REQUEST

B98-088-19 | Page 1 of 1

Collector: Robert Faulkner / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury 7471 - (CV)	Strontium-89/90 - Total SI	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		
Preservation				None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container				aG	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)				1	1	1	1	1	1	1	1		
Volume				30ml	60ml	60ml	60ml	60ml	120ml	120ml	1000ml		
B0P724	Soil	7-7-98	0920	X	X	X	X	X	X	X	X	B0P723	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION

Relinquished By	Date Time	Received By	Date Time
Jennie Nielson R. Nielson	7/9/98 1400	Fed Ex	
Fed Ex			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped to RECRA Lenville PA. Other analytes shipped to ThermoRichmond CA DAS 7/9/98

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

LABORATORY SECTION	Received By: Fedex	Title: Sample Custodian	Date Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date Time

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-18

Page 1 of 1

Collector: Robert Fahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha, Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89/90 - Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		
Sample No. / Matrix * / Sample Date / Sample Time										
B0P722 / Soil / 7-7-98 / 0856	X	X	X	X	X	X	X	X	B0P721	
	DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

000020

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Hance Nielsen & Nielsen	Date/Time: 7/7/98 14:4	Received By: Fed Ex	Date/Time
Relinquished By: Fedex	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to Thermo Richmond CA DAS 7/9/98

Matrix *: S - Soil; SI - 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: Joder	Title: Sample Custodian	Date/Time: 7/10/98 10:02
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-17

Page 1 of 1

Collector: Robert Fahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Quanterra Incorporated~~ 878 TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha, Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium - 89/90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		
Sample No	Matrix *	Sample Date	Sample Time							
B0P720	Soil	7-7-98	0856	X	X	X	X	X	X	X	X	B0P719	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

000021

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [signature]	Date/Time: 7/9/98 1400	Received By: Fed Ex	Date/Time
Relinquished By: Fedex	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to Thermo Richmond CA. DAS 7/9/98

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: [signature]	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-16

Collector: Robert Lahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Date Turnaround: 15 Days			
Project Designation: 216-A 29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Quantera Incorporated~~	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

000022

SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CVA)	Strontium-89/90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (ICL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		
Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		

Sample No	Matrix *	Sample Date	Sample Time										
B0P718	Soil	7-7-98	0844	X	X	X	X	X	X	X	X	B0P717	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [illegible]	Date/Time: [illegible]	Received By: [illegible]	Date/Time
Relinquished By: Fedex	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Superfund) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped to RECRA Lionville PA - Other analytes shipped to Thermo Richmond CA DAS 7/9/98

Matrix *

S	Soil
SI	Sediment
SO	Solid
SL	Sludge
W	Water
O	Oil
A	Air
DS	Drum Solid
DL	Drum Liquid
T	Tissue
WI	Wipe
L	Liquid
V	Vegetation
X	Other

LABORATORY SECTION	Received By: Stoler	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-15

Page 1 of 1

Collector: Robert Fahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL1381		Method of Shipment: Hand deliver
Shipped To: ~~Quanterra Incorporated~~ 5203 7-2-98 FMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

000023

Preservation				None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container				P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)				1	1	1	1	1	1	1	1		
Volume				20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS				Activity Scan	Gross Alpha, Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium 89/90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium 137, Cobalt 60)		
Sample No.	Matrix *	Sample Date	Sample Time										
B0P716	Soil	7-7-98	0831	X	X	X	X	X	X	X	X	B0P715	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: Spencer Nielsen - R Nielsen	Date/Time: 7/9/98 1402	Received By: FedEx	Date/Time
Relinquished By: FedEx	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to thermoRichmond CA DAS 7/9/98

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: Soder	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-14 | Page 1 of 1

Collector: Robert Fahlberg / DL Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL1381		Method of Shipment: Hand deliver
Shipped To: ~~Quanterra Incorporated~~ TMA 7-6-98	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha, Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium - 89/90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137 Cobalt-60)		

time on bottle 1146

000024

Sample No.	Matrix *	Sample Date	Sample Time									
B0P714	Soil	7-6-98	1215	X	X	X	X	X	X	X	X	B0P713
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[illegible]	7/9/98 1400	Fed Ex	
Fedex			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to thermo Richmond CA. DAS 7/9/98

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: [illegible]	Title: Sample Custodian	Date/Time: 7/10/98 10:00
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-13

Collector: Robert Lahlberg / DL Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.:	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: ~~Commercial Mail Pouch~~ BFA 7-6-98 FMA	Offsite Property No.:		Bill of Lading/Air Bill No.:
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

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

SAMPLE ANALYSIS

Sample No	Matrix *	Sample Date	Sample Time	Activity Scan	Gross Alpha, Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium 89/90 - Total Sr	PCBs - 8080	Semi-VOA 8270A (TCL)	Gamma Spectroscopy (Cesium 137 Cobalt 60)		
B0P712	Soil	7-6-98	1133	X	X	X	X	X	X	X	X	~~B0P711~~ B0P709	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98	DAS 7/9/98	

000025

CHAIN OF POSSESSION

Relinquished By	Date/Time	Received By	Date/Time
Robert Lahlberg / DL Bowers / P Nielsen	7/9/98 1440	Fedex	
Fedex			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Superfuce) [Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver]

Note: Above indicated sample containers shipped to RECRA Lionville PA. Other analytes shipped to thermo Richmond VA. DAS 7/9/98

Matrix *

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

LABORATORY SECTION: Received By: Storer; Title: Sample Custodian; Date/Time: 7/10/98 10[illegible]

FINAL SAMPLE DISPOSITION: Disposal Method; Disposed By; Date/Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-12

Page 1 of 1

Collector: Robert Fahlberg / DL Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: 7-6-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02.			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

000026

Preservation				None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container				P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)					1	1	1	1	1	1	1		
Volume				20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS				Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium - 89/90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium 137 Cobalt 60)		
Sample No.	Matrix *	Sample Date	Sample Time										
B0P710	Soil	7-6-98	1133	X	X	X	X	X	X	X	X	B0P709	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: [signature]	Date/Time: 7/9/98 1440	Received By: Fed Ex	Date/Time
Relinquished By: Fed Ex	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead Selenium, Silver)

Note: Above indicated sample containers shipped to RECRA Louisville, PA. Other analytes shipped to thermo, Richmond IA, DAS 7/9/98

Matrix *

S	Soil
SL	Sediment
SO	Solid
SI	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: [signature]	Title: Sample Custodian	Date/Time: 7/10/98 1000
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-11 | Page 1 of 1

Collector: Robert Fahlberg / DL Bowens	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: DTB 7-6-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89,90 -- Total S	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		

000027

Sample No	Matrix *	Sample Date	Sample Time										
B0P708	Soil	7-6-98	1117	X	X	X	X	X	X	X	X	B0P707	
				DAS 7/9/98	DAS 7/9/98			DAS 7/9/98			DAS 7/9/98		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Bruce Nielson P Nielson	7/9/98 1400	Fedex	
Jedley			

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped to RECRA Lionville PA, other analytes shipped to Thermo Richmond CA DAS 7/9/98

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: Stoller	Title: Sample Custodian	Date/Time: 7/10/98 10:00
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By: 4235 7951 3827	Date/Time

000028

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 216-A-29			DATA PACKAGE: H0164		
VALIDATOR: TLI		LAB: RCL		DATE: 9/18/78	
CASE:			SDG: H0164		

ANALYSES PERFORMED

☐ CLP Volatiles	☐ SW-846 8240 (cap column)	☐ SW-846 8260 (packed column)	☐ CLP Semivolatiles	☐ SW-846 8270 (cap column)	☐ SW-846 (packed column)
☐	☐	☐	☐	☐	☐

SAMPLES/MATRIX B0P708 B0P710 B0P712 B0P714
B0P716 B0P718 B0P720 B0P722 B0P724
B0P726

~~Water~~ 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:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

Is the GC/MS tuning/performance check acceptable? . . . . . Yes No N/A

Are initial calibrations acceptable? . . . . . Yes No N/A

Are continuing calibrations acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A

Are laboratory 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: ~~dup Bis(2-ethyl Hexyl) phthalate - J/UJ~~

5. ACCURACY

Were surrogates/System Monitoring Compounds analyzed? . . . . . Yes No N/A

Are surrogate/System Monitoring Compound recoveries acceptable? Yes No N/A

Were MS/MSD samples analyzed? . . . . . Yes No N/A

Are MS/MSD results acceptable? . . . . . ~~Yes~~ No N/A

Comments:

	MS	MSD	
4-nitrophenol	148	151	no qual nec
pentachlorophenol	121	117	all B

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

Are MS/MSD RPD 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: field dup bis(2ethyl Hexyl) phthalate ~~#~~ duplicate

7. SYSTEM PERFORMANCE

Were internal standards analyzed? . . . . . Yes No N/A

Are internal standard areas acceptable? . . . . . Yes No N/A

Are internal standard retention times acceptable? . . . . . Yes No N/A

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

Is compound identification acceptable? . . . . . Yes No N/A

Is compound quantitation acceptable? . . . . . Yes No N/A

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

Are results reported for all requested analyses? . . . . . Yes No N/A

Are all results supported in the raw data? . . . . . Yes No N/A

Do results meet the CRQLs? . . . . . Yes No N/A

Has the laboratory properly identified and coded all TIC? . . . Yes No N/A

Comments: all above

Date: 25 September 1998
To: Bechtel Hanford, Inc. (technical representative)
From: TechLaw, Inc.
Project: 216-A-29 Ditch - Soil
Subject: Radiochemistry - Data Package No. H0164-TNU (SDG No. H0164)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0164-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
B0P708	7/6/98	Soil	C	See note 1
B0P710	7/6/98	Soil	C	See note 1
B0P712	7/6/98	Soil	C	See note 1
B0P714	7/6/98	Soil	C	See note 1
B0P716	7/7/98	Soil	C	See note 1
B0P718	7/7/98	Soil	C	See note 1
B0P720	7/7/98	Soil	C	See note 1
B0P722	7/7/98	Soil	C	See note 1
B0P724	7/7/98	Soil	C	See note 1
B0P726	7/7/98	Soil	C	See note 1

1 - Gamma spectroscopy; gross alpha & gross beta; strontium-90.

Data validation was conducted in accordance with the BHI validation statement of work (BHI 1997). 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.

- **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 recovery range is 70% to 130%, while that for a matrix spike is 60% to 140%. 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 35 percent for soil samples and 20 percent for water samples, 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.

Field Duplicates

Two field duplicate pairs were submitted for analysis (B0P710/B0P712 and B0P720/B0P722). Both sample duplicate pairs were compared using the same criteria as the laboratory duplicate. All field duplicate sample results were acceptable.

- **Detection Levels**

Reported laboratory detection levels are reviewed to ensure that they are at or below the contract required MDA. All reported MDAs were at or below the analyte-specific CRDL.

- **Completeness**

Data Package No. H0164 (SDG No. H0164) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

BHI, MRB-SBB-A23665, *Validation Statement of Work*, Bechtel Hanford Incorporated, September 5, 1997.

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: H0164	REVIEWER: TLI	DATE: 09/25/98	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)

Project: BECHTEL-HANFORD																									
Laboratory: TNU																									
Case	SDG: H0164																								
Sample Number		B0P708		B0P710		B0P712		B0P714		B0P716		B0P718		B0P720		B0P722		B0P724		B0P726					
Location		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29		216-A-29					
Remarks						Duplicate										Duplicate									
Sample Date		7/6/98		7/6/98		7/6/98		7/6/98		7/7/98		7/7/98		7/7/98		7/7/98		7/7/98		7/7/98					
Radiochemistry	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	10	6.8		5.7		9.5		6.4		7.5		7		7.2		11		3.2	U	6.2					
Gross Beta	15	13		15		9.9		7.8		3.5	U	15		13		12		9.9		10					
Strontium-90	1	0.32		0.009	U	-0.071	U	0.005	U	-0.068	U	0.021	U	-0.015	U	-0.021	U	0.13	U	0.27					
Potassium-40	N/A	10		14		14		14		12		15		14		14		11		9.3					
Cobalt-60	0.05	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U				
Cesium-137	0.1	0.6		0.29		0.35		0.078		0.068		0.058		2		1.9		0.57		U	U				
Europium-152	0.1	U	U	U	U	U	U	U	U	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	U	U	U	U	U	U	U	U				
Europium-155	0.1	0.038	U	U	U	0.045	U	U	U	0.029	U	U	U	U	U	0.05		U	U	U	U				
Radium-226	0.1	0.37		0.53		0.54		0.55		0.5		0.7		0.57		0.57		0.44		0.35					
Radium-228	0.2	0.6		0.77		0.78		0.83		0.66		0.89		0.81		0.84		0.58		0.55					
Thorium-228	N/A	0.55		0.71		0.74		0.72		0.64		1.1		0.73		0.73		0.56		0.5					
Thorium-232	N/A	0.6		0.77		0.78		0.83		0.66		0.89		0.81		0.84		0.58		0.55					
Americium-241	N/A	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	0.096		U	U				
Uranium-238	N/A	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U				

000010

N807034-01

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0164

DATA SHEET

B0P708

SDG 7482 Client/Case no Hanford SDG H0164
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N807034-01 Client sample id B0P708
Dept sample id 7482-001 Location/Matrix 200 East SOLID
Received 07/10/98 Collected 07/06/98 11:17
Custody/SAF No B98-088-11 B98-088

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	6.8	3.5	4.1	10	J	80A
Gross Beta	12587-47-2	13	4.3	6.2	10		80B
Total Strontium	SR-89/90	0.32	0.13	0.19	1.0	J	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	10	0.40	0.21			GAM
Cobalt 60	10198-40-0	U		0.019	0.050	U	GAM
Cesium 137	10045-97-3	0.60	0.026	0.021	0.050		GAM
Europium 152	14683-23-9	U		0.045	0.10	U	GAM
Europium 154	15585-10-1	U		0.064	0.10	U	GAM
Europium 155	14391-16-3	0.038	0.036	0.052	0.10	U	GAM
Radium 226	13982-63-3	0.37	0.035	0.036	0.10		GAM
Radium 228	15262-20-1	0.60	0.085	0.085	0.20		GAM
Thorium 228	14274-82-9	0.55	0.022	0.023			GAM
Thorium 232	7440-29-1	0.60	0.085	0.085			GAM
Americium 241	14596-10-2	U		0.073		U	GAM
Uranium 238	U-238	U		2.2		U	GAM

KLS 9/21/98

000011

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/05/98

N807034-02

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0164

DATA SHEET

B0P710

SDG 7482 Client/Case no Hanford SDG H0164
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N807034-02 Client sample id B0P710
Dept sample id 7482-002 Location/Matrix 200 East SOLID
Received 07/10/98 Collected 07/06/98 01:33
Custody/SAF No B98-088-12 B98-088

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	5.7	3.0	3.3	10	J	80A
Gross Beta	12587-47-2	15	4.7	6.7	10		80B
Total Strontium	SR-89/90	0.009	0.15	0.20	1.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	14	0.28	0.10			GAM
Cobalt 60	10198-40-0	U		0.012	0.050	U	GAM
Cesium 137	10045-97-3	0.29	0.014	0.013	0.050		GAM
Europium 152	14683-23-9	U		0.027	0.10	U	GAM
Europium 154	15585-10-1	U		0.039	0.10	U	GAM
Europium 155	14391-16-3	U		0.038	0.10	U	GAM
Radium 226	13982-63-3	0.53	0.024	0.022	0.10		GAM
Radium 228	15262-20-1	0.77	0.054	0.051	0.20		GAM
Thorium 228	14274-82-9	0.71	0.016	0.014			GAM
Thorium 232	7440-29-1	0.77	0.054	0.051			GAM
Americium 241	14596-10-2	U		0.044		U	GAM
Uranium 238	U-238	U		1.4		U	GAM

9/21/98

000012

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/05/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0164

N807034-03

B0P712

DATA SHEET

SDG 7482 Client/Case no Hanford SDG H0164
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N807034-03 Client sample id B0P712
Dept sample id 7482-003 Location/Matrix 200 East SOLID
Received 07/10/98 Collected 07/06/98 11:33
Custody/SAF No B98-088-13 B98-088

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	9.5	3.6	3.2	10	J	80A
Gross Beta	12587-47-2	9.9	4.7	6.9	10	J	80B
Total Strontium	SR-89/90	-0.071	0.17	0.22	1.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	14	0.59	0.26			GAM
Cobalt 60	10198-40-0	U		0.029	0.050	U	GAM
Cesium 137	10045-97-3	0.35	0.036	0.031	0.050		GAM
Europium 152	14683-23-9	U		0.062	0.10	U	GAM
Europium 154	15585-10-1	U		0.10	0.10	U	GAM
Europium 155	14391-16-3	0.045	0.043	0.060	0.10	U	GAM
Radium 226	13982-63-3	0.54	0.052	0.048	0.10		GAM
Radium 228	15262-20-1	0.78	0.14	0.14	0.20		GAM
Thorium 228	14274-82-9	0.74	0.035	0.033			GAM
Thorium 232	7440-29-1	0.78	0.14	0.14			GAM
Americium 241	14596-10-2	U		0.042		U	GAM
Uranium 238	U-238	U		3.4		U	GAM

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9/21/98

000013

DATA SHEETS
Page 3
SUMMARY DATA SECTION
Page 11

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/05/98

N807034-04

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0164

DATA SHEET

B0P714

SDG	7482	Client/Case no	Hanford SDG H0164
Contact	N. Joseph Verville	Case no	TRB-SBB-207925
Lab sample id	N807034-04	Client sample id	B0P714
Dept sample id	7482-004	Location/Matrix	200 East SOLID
Received	07/10/98	Collected	07/06/98 12:15
		Custody/SAF No	B98-088-14 B98-088

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587 46-1	6.4	3.2	3.6	10	J	80A
Gross Beta	12587-47-2	7.8	4.6	6.9	10	J	80B
Total Strontium	SR-89/90	0.005	0.15	0.19	1.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966 00-2	14	0.56	0.27			GAM
Cobalt 60	10198 40-0	U		0.027	0.050	U	GAM
Cesium 137	10045 97-3	0.078	0.022	0.028	0.050		GAM
Europium 152	14683-23-9	U		0.056	0.10	U	GAM
Europium 154	15585-10-1	U		0.089	0.10	U	GAM
Europium 155	14391-16-3	U		0.064	0.10	U	GAM
Radium 226	13982-63-3	0.55	0.050	0.048	0.10		GAM
Radium 228	15262-20-1	0.83	0.11	0.12	0.20		GAM
Thorium 228	14274-82-9	0.72	0.030	0.029			GAM
Thorium 232	7440-29-1	0.83	0.11	0.12			GAM
Americium 241	14596-10-2	U		0.097		U	GAM
Uranium 238	U-238	U		3.1		U	GAM

9/21/98

Lab id	TMANC
Protocol	Hanford
Version	Ver 1.0
Form	DVD-DS
Version	3.06
Report date	08/05/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0164

N807034-05

B0P716

DATA SHEET

SDG 7482 Client/Case no Hanford SDG H0164
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N807034-05 Client sample id B0P716
Dept sample id 7482-005 Location/Matrix 200 East SOLID
Received 07/10/98 Collected 07/07/98 08:44
Custody/SAF No B98-088-15 B98-088

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	7.5	3.2	3.0	10	J	80A
Gross Beta	12587-47-2	3.5	5.0	8.2	10	U	80B
Total Strontium	SR-89/90	-0.068	0.11	0.16	1.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	12	0.30	0.13			GAM
Cobalt 60	10198-40-0	U		0.013	0.050	U	GAM
Cesium 137	10045-97-3	0.068	0.014	0.015	0.050		GAM
Europium 152	14683-23-9	U		0.029	0.10	U	GAM
Europium 154	15585-10-1	U		0.042	0.10	U	GAM
Europium 155	14391-16-3	0.029	0.028	0.041	0.10	U	GAM
Radium 226	13982-63-3	0.50	0.028	0.025	0.10		GAM
Radium 228	15262-20-1	0.66	0.061	0.058	0.20		GAM
Thorium 228	14274-82-9	0.64	0.018	0.015			GAM
Thorium 232	7440-29-1	0.66	0.061	0.058			GAM
Americium 241	14596-10-2	U		0.049		U	GAM
Uranium 238	U-238	U		1.6		U	GAM

RLS
9/21/98

000015

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/05/98

N807034-06

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0164

DATA SHEET

B0P718

SDG 7482 Client/Case no Hanford SDG H0164
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N807034-06 Client sample id B0P718
Dept sample id 7482-006 Location/Matrix 200 East SOLID
Received 07/10/98 Collected 07/07/98 08:56
Custody/SAF No B98-088-16 B98-088

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	7.0	3.4	3.7	10	J	80A
Gross Beta	12587-47-2	15	4.4	6.0	10		80B
Total Strontium	SR-89/90	0.021	0.12	0.16	1.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	15	0.60	0.30			GAM
Cobalt 60	10198-40-0	U		0.030	0.050	U	GAM
Cesium 137	10045-97-3	0.058	0.024	0.028	0.050		GAM
Europium 152	14683-23-9	U		0.062	0.10	U	GAM
Europium 154	15585-10-1	U		0.10	0.10	U	GAM
Europium 155	14391-16-3	U		0.058	0.10	U	GAM
Radium 226	13982-63-3	0.70	0.065	0.058	0.10		GAM
Radium 228	15262-20-1	0.89	0.12	0.12	0.20		GAM
Thorium 228	14274-82-9	1.1	0.049	0.044			GAM
Thorium 232	7440-29-1	0.89	0.12	0.12			GAM
Americium 241	14596-10-2	U		0.042		U	GAM
Uranium 238	U-238	U		3.4		U	GAM

RMe
9/21/98

000016

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/05/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0164

N807034-07

B0P720

DATA SHEET

SDG 7482 Client/Case no Hanford SDG H0164
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N807034-07 Client sample id B0P720
Dept sample id 7482-007 Location/Matrix 200 East SOLID
Received 07/10/98 Collected 07/07/98 08:56
Custody/SAF No B98-088-17 B98-088

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	7.2	3.1	3.0	10	J	80A
Gross Beta	12587-47-2	13	5.0	7.3	10		80B
Total Strontium	SR-89/90	-0.015	0.13	0.17	1.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	14	0.56	0.29			GAM
Cobalt 60	10198-40-0	U		0.028	0.050	U	GAM
Cesium 137	10045-97-3	2.0	0.054	0.035	0.050		GAM
Europium 152	14683-23-9	U		0.070	0.10	U	GAM
Europium 154	15585-10-1	U		0.089	0.10	U	GAM
Europium 155	14391-16-3	U		0.070	0.10	U	GAM
Radium 226	13982-63-3	0.57	0.055	0.057	0.10		GAM
Radium 228	15262-20-1	0.81	0.11	0.11	0.20		GAM
Thorium 228	14274-82-9	0.73	0.032	0.035			GAM
Thorium 232	7440-29-1	0.81	0.11	0.11			GAM
Americium 241	14596-10-2	U		0.11		U	GAM
Uranium 238	U-238	U		2.9		U	GAM

RW 9/21/98

000017

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/05/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0164

N807034-08

B0P722

DATA SHEET

SDG 7482 Client/Case no Hanford SDG H0164
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N807034-08 Client sample id B0P722
Dept sample id 7482-008 Location/Matrix 200 East SOLID
Received 07/10/98 Collected 07/07/98 08:56
Custody/SAF No B98-088-18 B98-088

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	11	4.0	3.8	10		80A
Gross Beta	12587-47-2	12	5.4	8.1	10		80B
Total Strontium	SR-89/90	-0.021	0.12	0.17	1.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	14	0.34	0.14			GAM
Cobalt 60	10198-40-0	U		0.015	0.050	U	GAM
Cesium 137	10045-97-3	1.9	0.032	0.017	0.050		GAM
Europium 152	14683-23-9	U		0.040	0.10	U	GAM
Europium 154	15585-10-1	U		0.048	0.10	U	GAM
Europium 155	14391-16-3	0.050	0.033	0.049	0.10	J	GAM
Radium 226	13982-63-3	0.57	0.034	0.032	0.10		GAM
Radium 228	15262-20-1	0.84	0.073	0.067	0.20		GAM
Thorium 228	14274-82-9	0.73	0.020	0.019			GAM
Thorium 232	7440-29-1	0.84	0.073	0.067			GAM
Americium 241	14596-10-2	U		0.058		U	GAM
Uranium 238	U-238	U		1.8		U	GAM

RMW
9/21/98

000018

DATA SHEETS
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SUMMARY DATA SECTION
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Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/05/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0164

N807034-09

B0P724

DATA SHEET

SDG 7482 Client/Case no Hanford SDG H0164
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N807034-09 Client sample id B0P724
Dept sample id 7482-009 Location/Matrix 200 East SOLID
Received 07/10/98 Collected 07/07/98 09:20
Custody/SAF No B98-088-19 B98-088

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	3.2	2.8	4.1	10	U	80A
Gross Beta	12587-47-2	9.9	4.1	6.0	10	J	80B
Total Strontium	SR-89/90	0.13	0.13	0.17	1.0	U	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	11	0.52	0.24			GAM
Cobalt 60	10198-40-0	U		0.029	0.050	U	GAM
Cesium 137	10045-97-3	0.57	0.036	0.028	0.050		GAM
Europium 152	14683-23-9	U		0.060	0.10	U	GAM
Europium 154	15585-10-1	U		0.092	0.10	U	GAM
Europium 155	14391-16-3	U		0.052	0.10	U	GAM
Radium 226	13982-63-3	0.44	0.048	0.045	0.10		GAM
Radium 228	15262-20-1	0.58	0.11	0.11	0.20		GAM
Thorium 228	14274-82-9	0.56	0.032	0.031			GAM
Thorium 232	7440-29-1	0.58	0.11	0.11			GAM
Americium 241	14596-10-2	0.096	0.029	0.038			GAM
Uranium 238	U-238	U		3.3		U	GAM

RK
9/21/98

000019

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/05/98

TMA/RICHMOND

SAMPLE DELIVERY GROUP H0164

N807034-10

B0P726

DATA SHEET

SDG 7482 Client/Case no Hanford SDG H0164
Contact N. Joseph Verville Case no TRB-SBB-207925

Lab sample id N807034-10 Client sample id B0P726
Dept sample id 7482-010 Location/Matrix 200 East SOLID
Received 07/10/98 Collected 07/07/98 09:42
Custody/SAF No B98-088-20 B98-088

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Gross Alpha	12587-46-1	6.2	3.1	3.3	10	J	80A
Gross Beta	12587-47-2	10	4.9	7.3	10		80B
Total Strontium	SR-89/90	0.27	0.11	0.15	1.0	J	SR
GAMMA SCAN ANALYTES		U					
Potassium 40	13966-00-2	9.3	0.43	0.20			GAM
Cobalt 60	10198-40-0	U		0.022	0.050	U	GAM
Cesium 137	10045-97-3	U		0.020	0.050	U	GAM
Europium 152	14683-23-9	U		0.046	0.10	U	GAM
Europium 154	15585-10-1	U		0.063	0.10	U	GAM
Europium 155	14391-16-3	U		0.051	0.10	U	GAM
Radium 226	13982-63-3	0.35	0.039	0.039	0.10		GAM
Radium 228	15262-20-1	0.55	0.086	0.086	0.20		GAM
Thorium 228	14274-82-9	0.50	0.024	0.023			GAM
Thorium 232	7440-29-1	0.55	0.086	0.086			GAM
Americium 241	14596-10-2	U		0.076		U	GAM
Uranium 238	U-238	U		2.4		U	GAM

RPR
9/21/98

Lab id TMANC
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 08/05/98

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Case Narrative

1.0 GENERAL

Thermo Nutech Sample Delivery Group H0164 is comprised of ten soil samples designated under SAF No. B98-088 with a Project Designation of : 216-A-29 Ditch-Soil.

The samples were received as stated on the Chain-of-Custody documents.

2.0 ANALYSIS NOTES

2.1 Gross Alpha/Gross Beta Analyses

No problems were encountered with the analyses.

2.2 Strontium-90 Analyses

No problems were encountered with the analyses.

2.3 Gamma Scan Analyses

Insufficient sample masses were received to aliquot the target 750g required to meet the RDL, as a some most RDL's were exceeded.

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-11

Collector: Robert Fahlberg / DL Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 13581		Method of Shipment: Hand deliver
Shipped To: ~~Quanterra Incorporated~~ TMA 07/07-6-98	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02.			COA

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha; Gross Beta	See item (1) in Special Instructions.	Mercury - 7471 (CV)	Strontium-89,90 – Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		
Sample No. / Matrix * / Sample Date / Sample Time										
B0P708 / Soil / 7-6-98 / 1117	X	X	X	X	X	X	X	X	B0P707	
			DAS 7/9/98	DAS 7/9/98		DAS 7/9/98	DAS 7/9/98			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[signature] Robert Fahlberg	7/7/98 1400	FedEx	
		[signature] C. CARACHANA	7/10/98 1130

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped directly to ~~RECRA, Louisville PA~~ Thermo Richmond CA DAS 7/9/98 Other analytes sent to ~~Thermo Richmond CA~~ RECRA ~~Louisville PA~~ DAS 7/9/98 DAS 7/9/98

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

000023

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-12

Collector: Robert Fahlberg / DL Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: 7-6-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02.			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

000024

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha; Gross Beta	See item (1) in Special Instructions.	Mercury - 7471 - (CV)	Strontium-89,90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		

Sample No.	Matrix *	Sample Date	Sample Time										
B0P710	Soil	7-6-98	1133	X	X	X	X	X	X	X	X	B0P709	
						DAS 7/9/98	DAS 7/9/98		DAS 7/9/98	DAS 7/9/98			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Bruce Nielson D. Nielson	7/9/98 1400	fed E-F	
		C. SANGALANG	7/10/98 / 1130

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped directly to ~~RECRA, Lionville, PA~~ Thermo Richmond CA DAS 7/9/98. Other analytes shipped to ~~Thermo, Richmond, CA~~ RECRA Lionville, PA DAS 7/9/98 DAS 7/9/98

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-15

Collector: Robert Fahlberg / DL Barnes	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Data Turnaround: 15 Days			
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: ~~Quantiferra Incorporated~~ RTA 7-6-98 TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02.			COA

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

0000025

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

SAMPLE ANALYSIS

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Gross Alpha; Gross Beta	See item (1) in Special Instructions.	Mercury - 7471 (CV)	Strontium-89,90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		
B0P712	Soil	7-6-98	1133	X	X	X	X	X	X	X	X	B0P711	
						DAS 7/9/98	DAS 7/9/98		DAS 7/9/98	DAS 7/9/98			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Lorene Nelson R. Nelson	7-7-98 1400	Fed Ex	
Relinquished By	Date/Time	Received By	Date/Time
		C. STANGEBANG	7/10/98 1130
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped directly to ~~Thermo Richmond CA~~ DAS 7/9/98 ~~RECRA, Lionville PA~~. Other analytes shipped to ~~Thermo Richmond, CA~~ RECRA Lionville, PA DAS 7/9/98 DAS 7/9/98

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
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

Collector: Robert Fahlberg / DL Bowens	Company Contact: Scott Petersen — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Data Turnaround: 15 Days
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East	SAF No.: B98-088	
Ice Chest No.	Field Logbook No.: EL1381	Method of Shipment: Hand deliver	
Shipped To: ~~Quanterra Incorporated~~ TMA DJB 7-6-98	Offsite Property No.	Bill of Lading/Air Bill No.	
Waste Designation: D002, D006, U133, and WT02.		COA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

000026

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		4
SAMPLE ANALYSIS	Activity Scan	Gross Alpha; Gross Beta	See item (1) in Special Instructions.	Mercury - 7471 - (CV)	Strontium-89,90 – Total Sr	PCBs - 8080	Semi-VOA - 8270A (TVA)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		

Sample No.	Matrix *	Sample Date	Sample Time										
B0P714	Soil	7-6-98	1215	X	X	X	X	X	X	X	X	B0P713	
						DAS 7/9/98	DAS 7/9/98		DAS 7/9/98	DAS 7/9/98			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Bruce Nielsen R. Nielsen	7/9/98 1400	Fed Ex	
		C. SANGALANG	7/10/98 1130

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped directly to ~~RECRA, Lionville, PA~~ Thermo Richmond CA. Other analytes shipped to ~~Thermo, Richmond CA~~ RECRA, Lionville, PA DAS 7/9/98 DAS 7/9/98

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-15

Collector Robert Fahlberg / D Bowers	Company Contact Scott Petersen Telephone No. 372-9574	Project Coordinator TRENT, SJ	Data Turnaround **15 Days**
Project Designation 216-A-29 Ditch - Soil	Sampling Location 200 East	SAF No. B98-088	
Ice Chest No.	Field Logbook No. EL1381	Method of Shipment Hand deliver	
Shipped To ~~Quanterra Incorporated~~ 5203 7-278 TMA	Offsite Property No.	Bill of Lading/Air Bill No.	
Waste Designation D002, D006, U133, and WT02.		COA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage
Cool 4C

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha; Gross Beta	See item (1) in Special Instructions.	Mercury - 7471 - (CV)	Strontium-89,90 – Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		

000027

Sample No.	Matrix *	Sample Date	Sample Time										
B0P716	Soil	7-7-98	0831	X	X	X	X	X	X	X	X	B0P715	
						DAS 7/9/98	DAS 7/9/98		DAS 7/9/98	DAS 7/9/98			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Renee Nielsen R. Nielsen	7/9/98 1400	Fed Ex	
		C. SANGALANG	7/10/98 1130

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated samples shipped directly to ~~RECRA~~ Thermo Richmond CA ~~Laboratory, Louisville, PA~~, other analytes sent to ~~Thermo~~ RECRA Louisville PA ~~Richmond CA~~ DAS 7/9/98

DAS 7/9/98

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
- DAS - Liquid
- X - 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

B98-088-16 Page

Collector: Robert Fahlberg / D Bowers	Company Contact: Scott Petersen — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Data Turnaround: 15 Days
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East	SAF No.: B98-088	
Ice Chest No.	Field Logbook No.: EL1381	Method of Shipment: Hand deliver	
Shipped To: 7-7-98 ~~Quanterra Incorporated~~	Offsite Property No.	Bill of Lading/Air Bill No.	
Waste Designation: D002, D006, U133, and WT02.		COA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

000028

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha; Gross Beta	See item (1) in Special Instructions	Mercury - 7471 - (CV)	Strontium-89,90 — Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		

Sample No.	Matrix *	Sample Date	Sample Time										
B0P718	Soil	7-7-98	0844	X	X	X	X	X	X	X	X	EOP	717
						DAS 7/9/98	DAS 7/9/98		DAS 7/9/98	DAS 7/9/98			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
[signature] B. Nielson	7/9/98 1400	[signature] EC	
		[signature] C S ANGALANG	7/10/98/1130

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) {Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver}

Note: Above indicated sample containers shipped directly to ~~RECRA, Lionville, PA~~ Thermo Richmond CA. Other analytes sent to ~~Thermo Richmond, CA~~ DAS 7/9/98 RECRA Lionville PA DAS 7/9/98

DAS 7/9/98

Matrix *
- S = Soil
- SE = Sediment
- SO = Solid
- SL = Sludge
- W = Water
- O = Oil
- A = Air
- DS = Drum Solids
- DL = Drum Liquids
- T = Tissue
- W = 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

B98-088-17 Page 1 of 1

Collector: Robert Fahlberg / D Bowers	Company Contact: Scott Petersen — Telephone No.: 372-9574	Project Coordinator: TRENT, SJ	Data Turnaround: 15 Days
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East	SAF No.: B98-088	
Ice Chest No.	Field Logbook No.: EL 1381	Method of Shipment: Hand deliver	
Shipped To: ~~Quanterra Incorporated~~ 7-7-98 BTB TMA	Offsite Property No.	Bill of Lading/Air Bill No.	
Waste Designation: D002, D006, U133, and WT02.		COA	

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

000029

Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)	1	1	1	1	1	1	1	1		
Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS	Activity Scan	Gross Alpha; Gross Beta	See item (1) in Special Instructions.	Mercury - 7471 - (CV)	Strontium-89,90 – Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		
Sample No.	Matrix *	Sample Date	Sample Time									
B0P720	Soil	7-7-98	0856	X	X	X	X	X	X	X	X	B0P719
						DAS 7/9/98	DAS 7/9/98		DAS 7/9/98	DAS 7/9/98		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Chee Nielsen R. Nielsen	7/9/98 1400	Fed Ex	
		C-S ANGALANA	7/10/98/1130

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped directly to Thermo Richmond CA. Other analytes sent to ~~Thermo Richmond, CA~~. DAS 7/9/98

DAS 7/9/98 ~~RECRA, Lionville, PA~~

RECRA Lionville PA DAS 7/9/98

Matrix *
- S = Soil
- SE = Sediment
- SO = Solid
- SL = Sludge
- W = Water
- O = Oils
- 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

398-088-13

Collector: Robert Fahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL1381		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02.			COA

Data Turnaround: **15 Days**

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

000030

Preservation				None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container				P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)				1	1	1	1	1	1	1	1		
Volume				20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		(4)
SAMPLE ANALYSIS				Activity Scan	Gross Alpha; Gross Beta	See item (1) in Special Instructions.	Mercury - 7471 - (CV)	Strontium-89,90 -- Total Sr	PCBs / 8080	Semi-VOA - 8270A (TC'.)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		
Sample No.	Matrix *	Sample Date	Sample Time										
B0P722	Soil	7-7-98	0856	X	X	X	X	X	X	X	X	B0P721	
						DAS 7/9/98	DAS 7/9/98		DAS 7/9/98	DAS 7/9/98			

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Renee Nielson R. Nielson	7/9/98 1440	Fed Ex	
		C. Jangalang	7/10/98 / 1130

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped directly to ~~RECRA, Liouville, PA~~ thermo Richmond CA. Other analytes sent to ~~thermo Richmond CA~~ RECRA Liouville PA DAS 7/9/98 DAS 7/9/98

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-19

Collector: Robert Fahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: EL 1381		Method of Shipment: Hand deliver
Shipped To: ~~Quanterra Incorporated~~ 7-7-98 BOB TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02.			COA

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

SAMPLE ANALYSIS

			Preservation	None	None	None	None	None	Cool 4C	Cool 4C	None		
			Type of Container	P	aG	aG	aG	aG	aG	aG	aG		
			No. of Container(s)	1	1	1	1	1	1	1	1		
			Volume	20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
				Activity Scan	Gross Alpha; Gross Beta	See item (1) in Special Instructions.	Mercury - 7471 - (CV)	Strontium-89,90 – Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		
Sample No.	Matrix *	Sample Date	Sample Time										
B0P724	Soil	7-7-98	0920	X	X	X	X	X	X	X	X	B0P723	
						DAS 7/9/98	DAS 7/9/98		DAS 7/9/98	DAS 7/9/98			

000031

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Nielson	7/7/98 1400	[illegible]	
Relinquished By	Date/Time	Received By	Date/Time
		E-J ANG/ANG	7/10/98 1130
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note: Above indicated sample containers shipped directly to ~~Thermo Richmond CA~~ ~~RECRA, Lionville, PA~~. Other analytes sent to ~~Thermo~~ RECRA ~~Richmond CA~~ Lionville PA DAS 7/9/98 ~~DAS 7/9/98~~ DAS 7/9/98 DAS 7/9/98

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

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B98-088-20

Collector: Robert Fahlberg / D Bowers	Company Contact: Scott Petersen	Telephone No.: 372-9574	Project Coordinator: TRENT, SJ
Project Designation: 216-A-29 Ditch - Soil	Sampling Location: 200 East		SAF No.: B98-088
Ice Chest No.	Field Logbook No.: ELB 81		Method of Shipment: Hand deliver
Shipped To: 7-7-98 ~~Quanterra Incorporated~~ TMA	Offsite Property No.		Bill of Lading/Air Bill No.
Waste Designation: D002, D006, U133, and WT02.			COA

Data Turnaround: 15 Days

POSSIBLE SAMPLE HAZARDS/REMARKS

Special Handling and/or Storage: Cool 4C

000032

Preservation				None	None	None	None	None	Cool 4C	Cool 4C	None		
Type of Container				P	aG	aG	aG	aG	aG	aG	aG		
No. of Container(s)				1	1	1	1	1	1	1	1		
Volume				20mL	60mL	60mL	60mL	60mL	120mL	120mL	1000mL		
SAMPLE ANALYSIS				Activity Scan	Gross Alpha; Gross Beta	See item (1) in Special Instructions.	Mercury - 7471 - (CV)	Strontium-89,90 -- Total Sr	PCBs - 8080	Semi-VOA - 8270A (TCL)	Gamma Spectroscopy (Cesium-137, Cobalt-60)		
Sample No.	Matrix *	Sample Date	Sample Time										
B0P726	Soil	7-7-98	0942	X	X	X	X	X	X	X	X	B0P725	
						DAS 7/9/98	DAS 7/9/98		DAS 7/9/98	DAS 7/9/98			

CHAIN OF POSSESSION — **Sign/Print Names**

Relinquished By	Date/Time	Received By	Date/Time
[signature] R Nielson	7/9/98 1410	Fed Ex	
		C. SANGKLANG	7/10/98 1130

SPECIAL INSTRUCTIONS

(1) ICP Metals - 6010A (Supertrace) (Arsenic, Barium, Cadmium, Chromium, Lead, Selenium, Silver)

Note! Above indicated sample containers shipped directly to ~~RECRA, Livonville, PA~~ Thermo Richmond CA. Other analytes sent to ~~Thermo Richmond CA~~ DAS 7/9/98 RECRA Livonville PA DAS 7/9/98

Matrix *
- S = Soil
- SE = Sediment
- SO = Solid
- SL = Sludge
- W = Water
- O = Oil
- A = DAS 7/9/98
- 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

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 216-A-29 Ditch Soil		DATA PACKAGE: H0164
VALIDATOR: ~~REF~~ FLI	LAB: THN	DATE: 11 Aug 95
CASE:		SDG: H0164

ANALYSES PERFORMED

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

SAMPLES/MATRIX

BOP708, BOP710, BOP712, BOP714, BOP716
BOP718, BOP720, BOP722, BOP724, BOP726

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: gr A+B SR90 – negative results

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: Gr A RPD 34% ok < 5x RPD

9. Field QC Samples . . . . . ☐ N/A

Field duplicate sample(s) analyzed? . . . . . Yes No N/A
Field duplicate RPD values acceptable? . . . . . Yes No N/A (yes)
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: gr A out 20/22 41% RPD
gr A 10/12 50% w/in CRDL
gr B 10/12 41%

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:

A-4

Review Comment Record (RCR)

1. Date	2. Review No.
9/28/98	BHI/QA98008
3. Project	4. Page
216-A-29 Ditch	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
H0164-RLN (SDG No. HO164)	216-A-29 Ditch - Soil	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	PCB: The table in the introduction states the analysis method was Pest/PCBs (8080); whereas, the laboratory narrative states the method was 8081.		corrected	
2	Inorganics: Note at bottom of the table in the Introduction the Note 1 states mercury was done by method 7470A which is for mercury in liquids; whereas, this sample is a solid and should be method 7471A.		Correct	
3	All: Pages need paginated.		Correct	
			Rcn 9/30/98	

Date: 25 September 1998
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 216-A-29 Ditch - Soil
Subject: Inorganics - Data Package No. H0164-RLN (SDG No. H0164)

INTRODUCTION

This memo presents the results of data validation on Data Package No. H0164-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
B0P708	7/6/98	Soil	C	See Note 1
B0P710	7/6/98	Soil	C	See Note 1
B0P712	7/6/98	Soil	C	See Note 1
B0P714	7/6/98	Soil	C	See Note 1
B0P716	7/7/98	Soil	C	See Note 1
B0P718	7/7/98	Soil	C	See Note 1
B0P720	7/7/98	Soil	C	See Note 1
B0P722	7/7/98	Soil	C	See Note 1
B0P724	7/7/98	Soil	C	See Note 1
B0P726	7/7/98	Soil	C	See Note 1

1- ICP metals by 6010A; mercury by 7471A

Data validation was conducted in accordance with the BHI validation statement of work. 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

Date: 25 September 1998
To: Bechtel Hanford Inc. (technical representative)
From: TechLaw, Inc.
Project: 216-A-29 Ditch - Soil
Subject: PCB - Data Package No. H0164-RLN (SDG No. H0164)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. H0164-RLN prepared by Recra LabNet (RLN). A list of the 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
B0P708	7/6/98	Soil	C	PCBs (8081)
B0P710	7/6/98	Soil	C	PCBs (8081)
B0P712	7/6/98	Soil	C	PCBs (8081)
B0P714	7/6/98	Soil	C	PCBs (8081)
B0P716	7/7/98	Soil	C	PCBs (8081)
B0P718	7/7/98	Soil	C	PCBs (8081)
B0P720	7/7/98	Soil	C	PCBs (8081)
B0P722	7/7/98	Soil	C	PCBs (8081)
B0P724	7/7/98	Soil	C	PCBs (8081)
B0P726	7/7/98	Soil	C	PCBs (8081)

Data validation was conducted in accordance with the BHI validation statement of work. 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

Review Comment Record (RCR)

1. Date	2. Review No.
9/28/98	BHI/QA98008
3. Project	4. Page
216-A-29 Ditch	Page 1 of 1

5. Document Number(s)/Title(s)	6. Program/Project/ Building Number	7. Reviewer	8. Organization/Group	9. Location/Phone
H0164-RLN (SDG No. HO164)	216-A-29 Ditch - Soil	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	PCB: The table in the introduction states the analysis method was Pest/PCBs (8080); whereas, the laboratory narrative states the method was 8081.			
2	Inorganics: Note at bottom of the table in the Introduction the Note 1 states mercury was done by method 7470A which is for mercury in liquids; whereas, this sample is a solid and should be method 7471A.			
3	All: Pages need paginated.			