START 9613497.1238

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W0429-DES

398

Quanterra Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
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CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
P.O. Box 1970
Richland, Washington 99352

March 1, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 18, 1995
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W0429
Data Deliverable	:	Standalone

I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7344-002	B0DMT2	50132203	Soil	01/18/95
7344-004	B0DMT3	50132205	Soil	01/18/95

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

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OK ~~00009~~
AMW 3/6/95

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Analyses requested: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 is included in this SDG to meet requirements.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike

V. Comments

Samples arrived in St. Louis at 0°C which is not within the recommended 4°C ± 2°C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See ROD-B95-013.

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Sample 7344-001 is included in this package only for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.

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I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Abby Weldon for Wade Price

Wade H. Price
Project Manager
e:\\sqmlo01\price$\abbydave\hanford\hanw0429.nar

9613497.1242

Analytical Data Package Prepared For

Bechtel Hanford

Chemical Analysis By

Quanterra Environmental Services
St. Louis Laboratory

Sample Delivery Group Number: W0429

BHI IDENTIFICATION NUMBER	QUANTERRA ID NUMBER
BODMT2	7344-002
BODMT3	7344-004

9613497.1243

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

DATE: 01/31/95	LABORATORY: Quanterra
PROJECT TITLE/NO.: 100-D Ponds/B94-098	NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable)

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable)

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples B0DMT2 and B0DMT3 should be reported in one standalone data package. Results for samples B0DMT6, B0DMS9, B0DMR2, B0DMR3, and B0DMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample B0DMT4 should be reported in one standalone data package. Results from samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, and B0DMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith/ R Clyde Smith — 1/31/95
OSM Project Coordinator (Print/Sign Name) — Date

M.T. Stankovich/ M T Stankovich — 2/13/95
Technical Representative (Print/Sign Name) — Date

N/A
Quality Assurance (Print/Sign Name) — Date

Quanterra January 23, 1995 03:38 pm
Account: 10722 Project: 550.56 Quanterra-Richland QAS No. 857 Rev. 0
Master Sample Login: 7344

Project Manager: W. Price

Draft: Final: Entered and Reviewed by: PM Review:

Sample Header Template:

Sample No. / Comments / Data:	Client ID	C-Matrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
7344-001	B0DMT6	Soil	17-JAN-95 09:02	18-JAN-95 10:50	22-FEB-95	FED-EX	1	Screening not Required
NOTE: RICHLAND ID 50132201								

#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
1	VI - Vial-40ml	S/9030/Q4	S	COLD	15-FEB-95	24-JAN-95	R9C	(124719:100)
1		TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C	(124720:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A	R9C	(124717:96)
1		AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124713:100)
1		BNA/8270/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C	(124715:98)
1		CL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124717:96)
1		FL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124717:96)
1		ICAP/6010/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124713:100)
1		NO2/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124717:96)
1		NO3/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124717:96)
1		NO3/353.1/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C	(124718:94)
1		OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124717:96)
1		PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124713:100)
1		PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C	(124716:97)
1		PM/IT/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124717:96)
1		SE/7740/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124713:100)
1		SO4/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124717:96)
1		TL/7841/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124713:100)
1		VOA/8240/Q4	S	COLD	15-FEB-95	31-JAN-95	109L	(124714:99)

7344-001DUP	B0DMT6	Soil	17-JAN-95 09:02	18-JAN-95 10:50	22-FEB-95	FED-EX	1	Screening not Required
NOTE: RICHLAND ID 50132201								

1	VI - Vial-40ml	S/9030/Q4	S	COLD	15-FEB-95	24-JAN-95	R9C	(124719:100)
1		TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C	(124720:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A	R9C	(124717:96)
1		CL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124717:96)
1		FL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124717:96)
1		NO2/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124717:96)
1		NO3/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124717:96)
1		NO3/353.1/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C	(124718:94)
1		OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124717:96)
1		SO4/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124717:96)

7344-001MS	B0DMT6	Soil	17-JAN-95 09:02	18-JAN-95 10:50	22-FEB-95	FED-EX	1	Screening not Required
NOTE: RICHLAND ID 50132201								

1	VI - Vial-40ml	S/9030/Q4	S	COLD	15-FEB-95	24-JAN-95	R9C	(124719:100)
1		TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C	(124720:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A	R9C	(124717:96)

3*=Sample has not been rad screened.

Quanterra January 23, 1995 03:38 pm
Account: 10722 Project: 550.56 Quanterra-Richland QAS No. 857 Rev. 0
Master Sample Login: 7344

Project Manager: W. Price

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No. / #	Client ID / Container Type	C-Matrix / Analysis	Class	Preservative	Date: Collected / Anal. Due Date	Received / Hold Date	Due / Site	Shipper	Rad Category / (Container Numbers:% Filled)	Rad Sample No.
Comments:										
1		AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124713:100)	
1		BNA/8270/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C		(124715:98)	
1		CL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C		(124717:96)	
1		FL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C		(124717:96)	
1		ICAP/6010/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124713:100)	
1		NO2/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C		(124717:96)	
1		NO3/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C		(124717:96)	
1		NO3/353.1/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C		(124718:94)	
1		OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C		(124717:96)	
1		PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124713:100)	
1		PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C		(124716:97)	
1		SE/7740/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124713:100)	
1		SO4/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C		(124717:96)	
1		TL/7841/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124713:100)	
1		VOA/8240/Q4	S	COLD	15-FEB-95	31-JAN-95	109L		(124714:99)	
7344-001MSD	B0DMT6	Soil			17-JAN-95 09:02	18-JAN-95 10:50	22-FEB-95	FED-EX	1 Screening not Required	
NOTE: RICHLAND ID 50132201										
1 AN - Amber Glass-120ML		AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124713:100)	
1		BNA/8270/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C		(124715:98)	
1		ICAP/6010/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124713:100)	
1		PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124713:100)	
1		PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C		(124716:97)	
1		SE/7740/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124713:100)	
1		TL/7841/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124713:100)	
1		VOA/8240/Q4	S	COLD	15-FEB-95	31-JAN-95	109L		(124714:99)	
7344-002	B0DMT2	Soil			17-JAN-95 09:35	18-JAN-95 10:50	22-FEB-95	FED-EX	1 Screening not Required	
NOTE: RICHLAND ID 50132203										
1 VI - Vial-40ml		S/9030/Q4	S	COLD	15-FEB-95	24-JAN-95	R9C		(124727:100)	
1		TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C		(124728:99)	
1 AN - Amber Glass-120ML		ANIONS/300.0/Q4	P	COLD	N/A	N/A	R9C		(124725:96)	
1		AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124721:100)	
1		BNA/8270/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C		(124723:98)	
1		CL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C		(124725:96)	
1		FL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C		(124725:96)	
1		ICAP/6010/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124721:100)	
1		NO2/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C		(124725:96)	
1		NO3/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C		(124725:96)	
1		NO3/353.1/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C		(124726:94)	
1		OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C		(124725:96)	
1		PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124721:100)	

3*=Sample has not been rad screened.

Quanterra January 23, 1995 03:38 pm

Account: 10722 Project: 550.56 Quanterra-Richland QAS No. 857 Rev. 0

Master Sample Login: 7344

Project Manager: W. Price

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No. / Client ID / C-Matrix / Date: Collected / Received / Due / Shipper / Rad Category / Rad Sample No.								
Comments								
#	Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Data:								
1		PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C	(124724:97)
1		PM/IT/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124725:96)
1		SE/7740/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124721:100)
1		SO4/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124725:96)
1		TL/7841/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124721:100)
1		VOA/8240/Q4	S	COLD	15-FEB-95	31-JAN-95	109L	(124722:99)
7344-003 / BODHR2 / Soil / 17-JAN-95 09:35 / 18-JAN-95 10:50 / 22-FEB-95 / FED-EX / 2 / R3431-002								
NOTE: RICHLAND ID 50132204								
1	VI - Vial-40ml	S/9030/Q4	S	COLD	15-FEB-95	24-JAN-95	R9C	(124735:100)
1		TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C	(124736:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A	R9C	(124733:96)
1		AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124729:100)
1		BNA/8270/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C	(124731:98)
1		CL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124733:96)
1		FL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124733:96)
1		ICAP/6010/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124729:100)
1		NO2/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124733:96)
1		NO3/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124733:96)
1		NO3/353.1/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C	(124734:94)
1		OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124733:96)
1		PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124729:100)
1		PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C	(124732:97)
1		PM/IT/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124733:96)
1		SE/7740/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124729:100)
1		SO4/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124733:96)
1		TL/7841/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124729:100)
1		VOA/8240/Q4	S	COLD	15-FEB-95	31-JAN-95	109L	(124730:99)
7344-004 / BODMT3 / Soil / 17-JAN-95 10:40 / 18-JAN-95 10:50 / 22-FEB-95 / FED-EX / 1 / Screening not Required								
NOTE: RICHLAND ID 50132205								
1	VI - Vial-40ml	S/9030/Q4	S	COLD	15-FEB-95	24-JAN-95	R9C	(124743:100)
1		TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C	(124744:99)
1	AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A	R9C	(124741:96)
1		AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124737:100)
1		BNA/8270/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C	(124739:98)
1		CL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124741:96)
1		FL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124741:96)
1		ICAP/6010/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124737:100)
1		NO2/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124741:96)
1		NO3/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124741:96)
1		NO3/353.1/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C	(124742:94)

3**Sample has not been rad screened.

Project Manager: W. Price

Draft: Final: Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No. / Client ID / C-Matrix / Date: Collected / Received / Due / Shipper / Rad Category / Rad Sample No.								
Comments								
# Container Type	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site		(Container Numbers:% Filled)
Data:								
1	OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C		(124741:96)
1	PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124737:100)
1	PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C		(124740:97)
1	PM/IT/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124741:96)
1	SE/7740/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124737:100)
1	SO4/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C		(124741:96)
1	TL/7841/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124737:100)
1	VOA/8240/Q4	S	COLD	15-FEB-95	31-JAN-95	109L		(124738:99)
7344-005 B0DMR3	Soil		17-JAN-95 10:47	18-JAN-95 10:50	22-FEB-95	FED-EX	1	Screening not Required
NOTE: RICHLAND ID 50132206								
1 VI - Vial-40ml	S/9030/Q4	S	COLD	15-FEB-95	24-JAN-95	R9C		(124751:100)
1	TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C		(124752:99)
1 AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A	R9C		(124749:96)
1	AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124745:100)
1	BNA/8270/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C		(124747:98)
1	CL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C		(124749:96)
1	FL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C		(124749:96)
1	ICAP/6010/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124745:100)
1	NO2/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C		(124749:96)
1	NO3/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C		(124749:96)
1	NO3/353.1/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C		(124750:94)
1	OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C		(124749:96)
1	PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124745:100)
1	PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C		(124748:97)
1	PM/IT/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124749:96)
1	SE/7740/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124745:100)
1	SO4/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C		(124749:96)
1	TL/7841/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124745:100)
1	VOA/8240/Q4	S	COLD	15-FEB-95	31-JAN-95	109L		(124746:99)
7344-006 B0DMT5	Soil		17-JAN-95 11:53	18-JAN-95 10:50	22-FEB-95	FED-EX	1	Screening not Required
NOTE: RICHLAND ID 50132207								
1 VI - Vial-40ml	S/9030/Q4	S	COLD	15-FEB-95	24-JAN-95	R9C		(124759:100)
1	TOX/9020/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C		(124760:99)
1 AN - Amber Glass-120ML	ANIONS/300.0/Q4	P	COLD	N/A	N/A	R9C		(124757:96)
1	AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124753:100)
1	BNA/8270/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C		(124755:98)
1	CL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C		(124757:96)
1	FL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C		(124757:96)
1	ICAP/6010/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C		(124753:100)
1	NO2/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C		(124757:96)

3*=Sample has not been rad screened.

Quanterra January 23, 1995 03:38 pm
Account: 10722 Project: 550.56 Quanterra-Richland QAS No. 857 Rev. 0
Master Sample Login: 7344

Project Manager: W. Price

Draft: Final; Entered and Reviewed by:_____ PM Review:_____

Sample Header Template: _____

Sample No.	Client ID	C-Metrix	Date: Collected	Received	Due	Shipper	Rad Category	Rad Sample No.
# Container Type	Comments	Analysis	Class	Preservative	Anal. Due Date	Hold Date	Site	(Container Numbers:% Filled)
Data:								
1		NO3/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124757:96)
1		NO3/353.1/Q4	S	COLD	15-FEB-95	14-FEB-95	R9C	(124758:94)
1		OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124757:96)
1		PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124753:100)
1		PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C	(124756:97)
1		PM/IT/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124757:96)
1		SE/7740/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124753:100)
1		SO4/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124757:96)
1		TL/7841/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124753:100)
1		VOA/8240/Q4	S	COLD	15-FEB-95	31-JAN-95	109L	(124754:99)
7344-007	B0DMS9	Soil	17-JAN-95 09:07	18-JAN-95 10:50	22-FEB-95	FED-EX	2	R3431-001
NOTE: RICHLAND ID 50132202								
1 AN - Amber Glass-120ML		ANIONS/300.0/Q4	P	COLD	N/A	N/A	R9C	(124765:96)
1		AS/7060/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124761:100)
1		CL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124765:96)
1		FL/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124765:96)
1		ICAP/6010/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124761:100)
1		NO2/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124765:96)
1		NO3/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124765:96)
1		OPHOS/300.0/Q4	C	COLD	15-FEB-95	19-JAN-95	R9C	(124765:96)
1		PB/7421/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124761:100)
1		PEST-PCB/8080/Q4	S	COLD	15-FEB-95	31-JAN-95	R9C	(124764:97)
1		PM/IT/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124765:96)
1		S/9030/Q4	S	COLD	15-FEB-95	24-JAN-95	R9C	(124765:96)
1		SE/7740/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124761:100)
1		SO4/300.0/Q4	C	COLD	15-FEB-95	14-FEB-95	R9C	(124765:96)
1		TL/7841/Q4	S	COLD	15-FEB-95	16-JUL-95	R9C	(124761:100)

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00020

3*=Sample has not been rad screened.

Temp 0°C   COR# 2909

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD*

Reference Document No. 453779
Page 1 of 4

Project Name/No. 1 B94-098
Sample Team Members 2
Profit Center No. 3 4632
Project Manager 4 V Pettey
Purchase Order No. 6
Required Report Date 11

Samples Shipment Date 7 1/18/95
Lab Destination 8 St Louis
Lab Contact 9
Project Contact/Phone 12
Carrier/Waybill No. 13

Bill to: 5 Quanterra Richland
509 375 3131
Report to: 10

White: To accompany samples   Yellow: Field copy

9613497.1249

ONE CONTAINER PER LINE

Sample Number 14	Sample Description/Type 15	Date/Time Collected 16	Container Type 17	Sample Volume 18	Pre-servative 19	Requested Testing Program 20	Condition on Receipt 21	Disposal Record No. 22
50132201 A	BODMTG / Soil	1-17-95/0902 ~~See WHC~~	AG ~~COC/SAR~~	125ml ~~250~~	4°C	ICP Metals TAL ~~See WHC COC/SAR~~	FOR LAB USE ONLY	100?
B		1-17-95/0902	AG	125ml		VOA		
C		1-17-95/0902	AG	125ml		Semi-VOA		
D		1-17-95/0902	AG	125ml		PCB/Pest		
E		1-17-95/0902	AG	40ml		Sulfide		
F		1-17-95/0902	AG	40ml		TOX		
G		1-17-95/0902	AG	125ml		Anions		
H		1-17-95/0902	AG	125ml		NO2/NO3		100?

Special Instructions: 23

Possible Hazard Identification: 24
Non-hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☑

Sample Disposal: 25
Return to Client ☑ Disposal by Lab ☐ Archive (mos.)

Turnaround Time Required: 26
Normal ☑ Rush ☐

QC Level: 27
I. ☐ II. ☐ III. ☐ Project Specific (specify): SDG W0386

1. Relinquished by 28 (Signature/Affiliation) [signature]	Date: 1/18/95 Time: 1600	1. Received by 28 (Signature/Affiliation) [signature] ST LOUIS Quanterra	Date: 1-19-95 Time: 1000
2. Relinquished by (Signature/Affiliation)	Date: Time:	2. Received by (Signature/Affiliation)	Date: Time:
3. Relinquished by (Signature/Affiliation)	Date: Time:	3. Received by (Signature/Affiliation)	Date: Time:

Comments: 29

*See back of form for special instructions.

00021

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Temp 0°C cart# 2909

Reference Document No.[30] 453779

Page 2 of 4

Project Name SDG W0386 | Project No. B94-098 | Samples Shipment Date 1/18/95

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-servative[19]	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
501322 02 A	BODM59 /soil	1-17-95/0707 ~~See WHC~~	AG ~~COC/SAR~~	125ml	4°C	ICP Metals-TAL ~~See WHC COC/SAR~~		100%
B			AG	125ml		PCB/Pest		
C		1-17-95/0908	AG	125ml		~~K Sou SRVR~~ Anions-IC		
3A	BODMT2	1-17-95/0835	AG	125ml		ICP Metals-TAL		
B			AG	125ml		VOA-TCL		
C			AG	125ml		Semi-VOA		
D			AG	125ml		PCB/Pest		
E			AG	40ml		Sulfide		
F			AG	40ml		TOX		
G			AG	125ml		Anions-IC		
H			AG	125ml		NO/NO3		
4A	BODMR2		AG	125ml		Metals		
B			AG	125ml		VOA		
C			AG	125ml		Semi-VOA		
D			AG	125ml		PCB/Pest		
E			AG	40ml		Sulfide		
F			AG	40ml		TOX		
G			AG	125ml		Anions		
H		1-17-95/0935	AG	125ml		NO2/NO3		
5A	BODMT3	1-17-95/1047	AG	125ml		IC Metals-TAL		100%

(White) To accompany samples Yellow: Field copy *See back of form for special instructions.

00022

9613491.1250

Temp 0°C CA/C# 2909

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 453779

Project Name W0386 Project No. B94-098 Samples Shipment Date 1/18/95

ONE CONTAINER PER LINE

Sample[14] Number	Sample[15] Description/Type	Date/Time[16] Collected	Container[17] Type	Sample[18] Volume	Pre-[19] servative	Requested Testing[20] Program	Condition on[21] Receipt	Disposal[22] Record No.
50132Z05 B	B0DMT3 /Soil	1-17-95/No Time ~~See WHC~~	AG ~~Doc~~/SAR	125ml	4°C	VOA ~~See WHC Doc~~/SAR		100%
C		1-17-95/1047		125ml		Semi-VOA		
D		1-17-95/1047		125ml		PCB/Pest		
E				40ml		Sulfide		
F				40ml		Tox		
G				125ml		Anions-IC		
H				125ml		NO2/NO3		
6A	B0DMR3					ICP-Metals		
B						VOA-TCL		
C						Semi-VOA-TCL		
D				125ml		PCB/Pest		
E				40ml		Sulfide		
F				40ml		Tox		
G				125ml		Anions-IC		
H		1-17-95/1047		125ml		NO2/NO3		
7A	B0DMT5	1-17-95/1153		125ml		ICP-Metals		
B				250ml		VOA-TCL		
C				250ml		Semi-VOA		
D				125ml ~~40ml~~		PCB/Pest ~~Sulfide~~		
E		1-17-95/1153	AG	40ml		~~Tox~~ Sulfide		100%

White: To accompany samples Yellow: Field copy

*See back of form for special instructions.

9613497.1251

00023

Temp 0°C chR#2909

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYSIS REQUEST AND CHAIN OF CUSTODY RECORD (cont.)*

Reference Document No.[30] 453779

Page 4 of 4

Project Name W0386 Project No. B94-098 Samples Shipment Date 1/18/95

ONE CONTAINER PER LINE

Sample 14 Number	Sample 15 Description/Type	Date/Time 16 Collected	Container 17 Type	Sample 18 Volume	Pre-19 servative	Requested Testing 20 Program	Condition on 21 Receipt	Disposal 22 Record No.
50132207F	BODMTS /Soil	1/17/95 /1153 ~~See WHC~~	AG ~~COC/SAR~~	40ml	4°C	TOX ~~See WHC COC/SAR~~		100%
G			AG	125ml		Anions IC		100%
H		1/17/95/1153	AG	250ml		NO2/NO3		100%
(initials) 1/18/95								

White: To accompany samples

Yellow: Field copy

*See back of form for special instruc

9613497.1252

00024

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of ~~1~~ 2

1-17-95 wst

Data Turnaround: [ ] Priority [X] Normal — wst 1-17-95

Collector: Dave St. John, Doug Bowers/~~Dav~~ Wendy Thompson	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: SML 457 and ER 14	Field Logbook No.:	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.:	Bill of Lading/Air Bill No.: N/A

Possible Sample Hazards/Remarks:

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	Cool 4°	COOL 4	Cool 4°				
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	G	G			
No. of Container(s)	1	1	1	1	1	1	1	1	3	1	1	1			
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	500ml	950ml			
SAMPLE ANALYSIS 501322	ICP METALS-TAL/AA MATALS (As,Pb,Se,Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	Total alpha beta Gamma Spec.	total alpha beta gamma Spec	501323		

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	Total Alpha/Beta, GEA	Activity Scan	Total alpha beta Gamma Spec.	total alpha beta gamma Spec	501323		
wst 1-17-95 ~~BODMR4~~ BODMT6	1 S	1/17/95	0902	X	X	X	X	X	X	X	X	X wst 1-17-95	X	X	X	01		
BODMS9	2 S	1/17/95	0907	X A			X B	X C				wst	X	X	X	2		
BODMT2	3 S	1/17/95	0935	X	X	X	X	X	X	X	X	X	X	X	X	3		
BODMR2	4 S	1/17/95	0935	X	X	X	X	X	X	X	X	X	X			4		
BODMT3	5 S	1/17/95	1047	X	X	X	X	X	X	X	X		X	X	X	5		
BODMR3	6 S	1/17/95	1047	X	X	X	X	X	X	X	X	X	X			6		

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-18-95/0830	[signature] B. Whitten ERC	0830 1-18-95
[signature] B. Whitten ERC	1-18-95 1050	A. Boyd Quanterra	1-18-95 1050

SPECIAL INSTRUCTIONS

DATA DELIVERABLE-STAND ALONE.
LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET.

*=THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g

BODMT2 - total alpha/beta/gamma provided w/ 1x500 ml and 1x950 ml.

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
			SDG W0386
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613497.1253

00025

wst 1-17-95

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 7 of 7 wst 1-17-95

Data Turnaround: [ ] Priority [X] Normal

Collector	Dave St John, Doug Bowers
Company Contact	RC SMITH/MT STANKOVICH
Telephone No.	(509)372-2537/(509)376-2493
Project Designation	100-D PONDS PHASE II SAMPLING Wendy Thompson
Sampling Location	100-D
SAF No.	B94-098
Ice Chest No.	Sml 457 and ER-14
Field Logbook No.	
Method of Shipment	HAND DELIVER
Shipped To	QUANTERRA
Offsite Property No.	
Bill of Lading/Air Bill No.	N/A
Possible Sample Hazards/Remarks	
Special Handling and/or Storage	COOL TO 4 DEGREES CENTIGRADE

	A	B	C	D	E	F	G	H							
Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4		COOL 4					
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	aG	aG			
No. of Container(s)	1	1	1	1	1	1	1	1	3	1	1	1			
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	500ml	950ml			
SAMPLE ANALYSIS 501322	ICP METALS-TAL/AA MATALS (As,Pb,Se,Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	Total alpha beta gamma spec	total alpha beta gamma spec	501323		

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H							
~~B0DMT4~~ B0DMT5 (wst 1-17-95)	~~?~~ S	1/17/95	1153	X	X	X	X	X	X	X	X		X	X	X	07		

CHAIN OF POSSESSION	Date/Time	Sign/Print Names	Date/Time
Relinquished By: Doug Bowers	1-18-95/0830	Received By: ERC Kim Whitten B.Wh.Hev	0830 1-18-95
Relinquished By: ERC Kim Whitten B.Wh.Hev	1-18-95 1050	Received By: B. Bayd Quanterra	1-18-95 1050
Relinquished By		Received By	
Relinquished By		Received By	

SPECIAL INSTRUCTIONS

DATA DELIVERABLE-STAND ALONE.
LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET.

*=THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g

SDG W0386

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613497.1254

000026

RL # ~~[illegible]~~ 3431 7344 550.56

011895G WQ2

BODMR2 and BODMS9 are Cat. II. Others are Cat. I. JBM 18 Jan 95

TENNELEC #2

SCREENING CALCULATION SPREADSHEET

Customer Code	Recieved Date		Screening Prep Date		Count Date	Mnts Cntd	BACKGROUND Alpha	Beta	Mnts
WHC	1-18-95			1-18	1-18	10	20	225	240

	Customer ID WHC	Sample Matrix Solid/Liquid	Residue Wght mg	Vol. Anal. mg ml	Sample Size Gm L	SMPLE CNT DATA Hldr Num.	Total Alpha	Counts Beta	Net Sample Counts/Minute Alpha	Beta	DPM / Aliquot Alpha	Beta	uCi per Sample Alpha	Beta	pCi / Gm or L Alpha	Beta	1-sigma error pCi/ Gm or L Alpha	Beta	Category 1 Yes/No	Aliquot to Cat 1 Gm or L Alpha	Beta
	B0DM13	LIQUID	0 0	10 0	1.0	35	0	14	-0 08	0 48	-3.5E-01	1.04E+00	0 0E+00	4.7E-05	-1 6E+01	4 7E+01	41 26	37 21	Yes	-6 4E+02	2 1E+03
	B0DM15	LIQUID	0 0	10 0	1 0	36	0	12	-0.08	0 26	-3 4E-01	6 13E-01	0 0E+00	2 8E-05	-1 5E+01	2 8E+01	41.33	34 70	Yes	-6 6E+02	3 6E+03
	B0DLX3	LIQUID	1.1	10 0	1.0	37	0	11	-0 08	0 18	-3 3E-01	4 00E-01	0 0E+00	1.8E-05	-1.5E+01	1.8E+01	41.37	33 37	Yes	-6 7E+02	5 6E+03
	B0DN07	LIQUID	2 6	10 0	1.0	38	6	22	0 52	1 28	1.96E+00	2 35E+00	8 8E-05	1.1E-04	8 8E+01	1.1E+02	55.63	44 04	Yes	1 1E+02	9 5E+02
002	B0DMR2	SOLID	97 6	97 6	623 0	39	7	34	0 62	2.48	4 45E+00	5 47E+00	1 3E-02	1 6E-02	2.1E+01	2 5E+01	11 24	6 38	No	4 9E+02	4 0E+03
	B0DMR3	SOLID	93.2	93 2	420 0	40	4	25	0 32	1.58	2 20E+00	3 51E+00	4 5E-03	7.1E-03	1.1E+01	1.7E+01	10 22	5 78	Yes	9 4E+02	5 9E+03
	B0DMT2	SOLID	90 6	90 6	907 0	41	4	40	0 32	3 06	2.05E+00	7.09E+00	9 3E-03	3 2E-02	1 0E+01	3 5E+01	10 29	7 48	Yes	9 8E+02	2 8E+03
	B0DMT3	SOLID	99.7	99.7	659 0	42	4	30	0 32	2.08	2 25E+00	4.75E+00	6 7E-03	1.4E-02	1.0E+01	2 1E+01	9 88	5 97	Yes	9 9E+02	4 7E+03
	B0DMT5	SOLID	56 8	56 8	715 0	43	4	34	0 32	2 48	1.68E+00	5.39E+00	9 6E-03	3.1E-02	1.3E+01	4.3E+01	13.34	10.52	Yes	7 5E+02	2 3E+03
	B0DMT8	SOLID	94.7	94.7	1144 0	44	3	13	0.22	0.38	1 58E+00	7.04E-01	8 6E-03	3 8E-03	7 5E+00	3 3E+00	9 73	4.18	Yes	1 3E+03	3 0E+04
001	B0DMS9	SOLID	82.5	82.5	835 0	45	7	33	0.62	2 38	4.08E+00	5.12E+00	1.9E-02	2 3E-02	2.2E+01	2.8E+01	12.21	7.27	No	4 5E+02	3 6E+03

9613497.1255

Jal Koch 01-20-95 09:15

00027

AMPLE STATUS REPORT FOR N 4329. RAD SCREEN BODMT6 TIME: 1/18/95 8: 0
DISPATCHED: 1/10/95 10:29 SAMPLE HAS NOT BEEN SLURPED PAGE 1
RECEIVED: 1/18/95 7:54

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5442

END OF REPORT

AMPLE STATUS REPORT FOR N 4323. RAD SCREEN BODMS9 TIME: 1/18/95 7:59
DISPATCHED: 1/10/95 10:29 SAMPLE HAS NOT BEEN SLURPED PAGE 1
RECEIVED: 1/18/95 7:53

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5442

END OF REPORT

AMPLE STATUS REPORT FOR N 4325. RAD SCREEN BODMT2 TIME: 1/18/95 7:59
DISPATCHED: 1/10/95 10:29 SAMPLE HAS NOT BEEN SLURPED PAGE 1
RECEIVED: 1/18/95 7:54

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5442

END OF REPORT

961349?.1259

AMPLE STATUS REPORT FOR N 4306. RAD SCREEN BODMR2 TIME: 1/18/95 7:57
DISPATCHED: 1/10/95 10:27 SAMPLE HAS NOT BEEN SLURPED PAGE 1
RECEIVED: 1/18/95 7:53

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5442

END OF REPORT

00031

9613497.1260

AMPLE STATUS REPORT FOR N 4326. RAD SCREEN BODMT3 TIME: 1/18/95 7:59
DISPATCHED: 1/10/95 10:29 SAMPLE HAS NOT BEEN SLURPED PAGE 1
RECEIVED: 1/18/95 7:54

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5442

END OF REPORT

AMPLE STATUS REPORT FOR N 4307. RAD SCREEN BODMR3 TIME: 1/18/95 7:57
DISPATCHED: 1/10/95 10:27 SAMPLE HAS NOT BEEN SLURPED PAGE 1
RECEIVED: 1/18/95 7:54

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5442

END OF REPORT

AMPLE STATUS REPORT FOR N 4328. RAD SCREEN BODMT5 TIME: 1/18/95 8: 0
DISPATCHED: 1/10/95 10:29 SAMPLE HAS NOT BEEN SLURPED PAGE 1
RECEIVED: 1/18/95 7:54

EXT.	DETER.	RESULTS OR STATUS	OUT OF RANGE?	GOOD ANS?	CHARGE CODE
****	********	**********	***	***	******
4271	TOT-ACT	< 5.00000E 01 pCi/G	N	Y	XR5442

END OF REPORT

9613497.1265

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 1/18/95 1050 Client Name BHI

Project/Client # B94-098 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) ER-14

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☑ No ☐
3. Custody Seals dated and signed? Yes ☑ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☑
5. Vermiculite/packing material is: Wet ☐ Dry ☑
6. Each sample is in a plastic bag? Yes ☑ No ☐
7. Number of sample containers in cooler: 35
8. Samples have: ____ tape ____ hazard labels
   ✓ custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☑ No ☐

Sample temperature 3°C

11. The following paperwork should be accounted for (N/A if not applicable): N/A
    Chain of Custody #'(s) _____
    Request for analysis #(s) _____
    Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes ☐ No ☑
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature R. Boyd R. Boyd Date/Time 1/18/95 1050

FORM NO. LS-042, Rev.0, 2/94

9615497.1204

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2300 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 1/18/95 1050 Client Name BHI

Project/Client # 694-098 Batch or Case # _____

Cooler ID (if noted on the outside of cooler) SML 457

1. Condition of shipping container? OK
2. Custody Seals on cooler intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☒
5. Vermiculite/packing material is: Wet ☐ Dry ☒
6. Each sample is in a plastic bag? Yes ☒ No ☐
7. Number of sample containers in cooler: 39
8. Samples have: _____ tape _____ hazard labels
   X custody seals ✓ appropriate sample labels
9. Samples are: ✓ in good condition _____ leaking
   _____ broken _____ have air bubbles
   _____ other
10. Coolant present? Yes ☒ No ☐

Sample temperature 4°C

11. The following paperwork should be accounted for (N/A if not applicable): N/A
    Chain of Custody #'(s) _____
    Request for analysis #(s) _____
    Airbill # _____ Carrier _____
12. Have any anomalies been identified above? Yes ☐ No ☐
13. Memos have been initiated for all anomalies identified above? Yes ☐

Printed Name/Signature R. Boyd Robin Boyd Date/Time 1/18/95 1050

FORM NO. LS-042, Rev.0, 2/94

9613497.1265

SAMPLE RECEIPT VARIANCE REPORT
ITAS-RICHLAND LABORATORY

WORK ORDER NUMBER: 501322 DATE INITIATED: 1/18/95

INITIATED BY: TGilmore

DATE/TIME OF SAMPLE (AND/OR RFA & COC) RECEIPT: 1/18/95 1050

CLIENT SAMPLE NUMBER	RFA/COC NUMBERS	ANALYSIS REQUESTED
BODM59		

Samples were received with the following deficiencies:

- ☐ 1. Not enough sample received for proper analysis.
- ☐ 2. Sample received without proper preservative.
- ☐ 3. No sample received in container.
- ☐ 4. Sample received without a RFA/COC form.
- ☐ 5. No sample ID on container.
- ☐ 6. Sample received broken or leaking.
- ☐ 7. Holding time exceeded at receipt.
- ☐ 8. Custody tape broken.
- ☐ 9. COC not relinquished by client.
- ☑ 10. Sample information on container does not match sample information on the paper work (Explain below).
- ☐ 11. All shipping containers (coolers) on waybill not received with shipment.
  - ☐ RFA/COC received
  - ☐ RFA/COC not received
- ☐ 12. Other (Explain below).

NOTES: COC Show 40 ml Sulfide - container received is a 125 ml marked Anions.

SUPERVISOR REVIEW: _____

PROJECT MANAGER REVIEW: _____

TELEPHONED TO: _____ ON _____ BY _____

TELEFAXED TO: _____ ON _____ BY _____

SIGNED ORIGINAL MUST BE RETAINED IN WORK ORDER FILE

FORM NO. LS-023, 3/92, Rev. 0

00037

9613497.1266

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-03041-3

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng. Support	Field & Analytical Supp	Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☐ Prepaid ☐ Collect

Shipped to	Off-site Custodian
Company: Quanterra (IT) Address: 2800 Geo Wash Way City: Richland, State: Washington, Zip Code: 99352 Country:	On-site Custodian / Payroll No.

Qty.	Property No.	Description (Include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 1bs		Sample #: BOOMT6 BOOMS9 BOOMT2 BOOMR2 BOOMT3 BOOMR3 Cooler ID: SML-457 & ER41 BOOMT5 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 1bs		~~Sample #:~~ Cooler ID: Polycooler with groundwater ~~samples~~ packed in wet ice and vermiculite	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☒ Required for Project Work. List Project No. 100-D-PONDS PHASE II

☐ Business Trip Bill of Lading #: N/A

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. N/A

☐ Other (Please specify) Sampling supports RI/FS work in the 100 AREA

RECEIVED

JAN 18 1995

PROPERTY RECORDS

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
Paul Bracco	RARA - 0051	1-18-95

Location of and Contact for Property (Name/Phone No./Bldg./Area)

B.T. Whitten (509) 376-7777

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
1-18-95	ITE 2072 PV3AA	

Originated By	Date	Authorized By	Date
B.T. WHITTEN	1-18-95	Bill Whitten	1-18-95
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		Debbie Rives	1/18/95

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date

DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

*U.S. GPO: 1994-592-170/00029

54-3000-479 (01/94)

A. Boyd Quanterra 1/18/95 1050

00038

Quanterra Environmental Services 613497.1267

C.U.R. and C.O.C.
COPIED TO: BW/WP
DATE: 1-19-95
TIME: 1230
BY: Faith Walker

Work Order No.: 7344

Condition Upon Receipt Variance Report
St. Louis Laboratory

Client: Richland

Date: 1-19-95 1000

Project No: 550.56

Initiated by: Faith Walker

Analysis Requested: Refer to RFA/COC

RFA/COC Numbers: 453779

Client Sample Numbers Affected: Entire Login

Condition/Variance (Check all that apply): Circle Number to Denote that Item was Evaluated. "NA" = "Not Applicable".

1. NA Not enough sample received for proper analysis. Received approximately: _____
2. ☐ Sample received broken/leaking.
3. ☐ Sample received without proper preservative.
   - ☐ Cooler temperature not within 4°C ± 2°C. Record temperature: 0°C
   - ☐ pH _____
   - ☐ other: _____
4. ☐ Sample received in improper container.
5. ☐ Sample received without proper paperwork. Explain: _____
6. ☐ Paperwork received without sample.
7. ☐ No sample ID on sample container.
8. ☐ Custody tape disturbed/broken/missing.
9. NA Sample splits performed by lab.
10. NA Volatile sample received with approximately _____ mm headspace.
11. ☐ Sample ID on container does not match sample ID on paperwork. Explain: _____
12. ☐ All coolers on airbill not received with shipment.
13. ☐ Other (explain below): Shipping containers not rad surveyed.

Notes:

Corrective Action:

☐ Client's Name: _____ Informed verbally on: _____ By: _____

☑ Client's Name: Quanterra Richland Informed ~~in writing~~ by e-mail on: 1/20/95 By: Abby Wilder

☐ Sample(s) processed "as is". Comments: _____

☐ Sample(s) on hold until: _____ If released, notify: _____

Sample Control Supervisor Review: (or designate) Sue Wilson Date: 01-20-95

Project Management Review: Abigail Wilder Date: 1/20/95

SIGNED ORIGINAL MUST BE RETAINED IN THE PROJECT FILE

9613497.1268

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: VOA-TCL
Method: EPA 8240
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID: BODMT6

Quanterra ID : 7344-001

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Chloromethane	74-87-3	QCBLK57743-1	01/25/95	01/25/95	10	UG/KG	U	10	1
Bromomethane	74-83-9	QCBLK57743-1	01/25/95	01/25/95	10	UG/KG	U	10	1
Vinyl Chloride	75-01-4	QCBLK57743-1	01/25/95	01/25/95	10	UG/KG	U	10	1
Chloroethane	75-00-3	QCBLK57743-1	01/25/95	01/25/95	10	UG/KG	U	10	1
Methylene Chloride	75-09-2	QCBLK57743-1	01/25/95	01/25/95	4	UG/KG	BJ	5	1
Acetone	67-64-1	QCBLK57743-1	01/25/95	01/25/95	8	UG/KG	BJ	100	1
Carbon Disulfide	75-15-0	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
1,1-Dichloroethene	75-35-4	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
1,1-Dichloroethane	75-34-3	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
1,2-Dichloroethene (total)	540-59-0	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Chloroform	67-66-3	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
1,2-Dichloroethane	107-06-2	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
2-Butanone	78-93-3	QCBLK57743-1	01/25/95	01/25/95	100	UG/KG	U	100	1
1,1,1-Trichloroethane	71-55-6	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Carbon Tetrachloride	56-23-5	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Bromodichloromethane	75-27-4	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
1,2-Dichloropropane	78-87-5	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
cis-1,3-Dichloropropene	10061-01-5	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Trichloroethene	79-01-6	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Dibromochloromethane	124-48-1	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
1,1,2-Trichloroethane	79-00-5	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Benzene	71-43-2	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
trans-1,3-Dichloropropene	10061-02-6	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Bromoform	75-25-2	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
4-Methyl-2-Pentanone	108-10-1	QCBLK57743-1	01/25/95	01/25/95	50	UG/KG	U	50	1
2-Hexanone	591-78-6	QCBLK57743-1	01/25/95	01/25/95	50	UG/KG	U	50	1
Tetrachloroethene	127-18-4	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
1,1,2,2-Tetrachloroethane	79-34-5	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Toluene	108-88-3	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Chlorobenzene	108-90-7	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
EthylBenzene	100-41-4	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Styrene	100-42-5	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Xylene (total)	1330-20-7	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	U	5	1
Nonanal	124-19-6	QCBLK57743-1	01/25/95	01/25/95	5	UG/KG	J		1
Toluene-d8 (SURR)	2037-26-5	QCBLK57743-1	01/25/95	01/25/95	97	%REC			1
Bromofluorobenzene (SURR)	460-00-4	QCBLK57743-1	01/25/95	01/25/95	92	%REC			1
1,2-Dichloroethane-d4 (SURR)	17070-07-0	QCBLK57743-1	01/25/95	01/25/95	95	%REC			1

CC070

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: VOA-TCL
Method: EPA 8240
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID: BODMT6

Quanterra ID : 7344-001MS

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
1,1-Dichloroethene	75-35-4	QCBLK57814-1	01/26/95	01/26/95	84	%REC			1
Trichloroethene	79-01-6	QCBLK57814-1	01/26/95	01/26/95	98	%REC			1
Benzene	71-43-2	QCBLK57814-1	01/26/95	01/26/95	96	%REC			1
Toluene	108-88-3	QCBLK57814-1	01/26/95	01/26/95	95	%REC			1
Chlorobenzene	108-90-7	QCBLK57814-1	01/26/95	01/26/95	94	%REC			1
Toluene-d8 (SURR)	2037-26-5	QCBLK57814-1	01/26/95	01/26/95	99	%REC			1
Bromofluorobenzene (SURR)	460-00-4	QCBLK57814-1	01/26/95	01/26/95	96	%REC			1
1,2-Dichloroethane-d4 (SURR)	17070-07-0	QCBLK57814-1	01/26/95	01/26/95	95	%REC			1

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: VOA-TCL
Method: EPA 8240
Matrix: SOLID

Client ID: BODMT6

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Quanterra ID : 7344-001MSD

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
1,1-Dichloroethene	75-35-4	QCBLK57814-1	01/26/95	01/26/95	88	%REC			1
Trichloroethene	79-01-6	QCBLK57814-1	01/26/95	01/26/95	96	%REC			1
Benzene	71-43-2	QCBLK57814-1	01/26/95	01/26/95	96	%REC			1
Toluene	108-88-3	QCBLK57814-1	01/26/95	01/26/95	96	%REC			1
Chlorobenzene	108-90-7	QCBLK57814-1	01/26/95	01/26/95	100	%REC			1
Toluene-d8 (SURR)	2037-26-5	QCBLK57814-1	01/26/95	01/26/95	103	%REC			1
Bromofluorobenzene (SURR)	460-00-4	QCBLK57814-1	01/26/95	01/26/95	97	%REC			1
1,2-Dichloroethane-d4 (SURR)	17070-07-0	QCBLK57814-1	01/26/95	01/26/95	93	%REC			1

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: VOA-TCL
Method: EPA 8240
Matrix: SOLID

Client ID: BODMT2

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Quanterra ID : 7344-002

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Chloromethane	74-87-3	QCBLK57743-1	01/25/95	01/25/95	18	UG/KG	U	18	1
Bromomethane	74-83-9	QCBLK57743-1	01/25/95	01/25/95	18	UG/KG	U	18	1
Vinyl Chloride	75-01-4	QCBLK57743-1	01/25/95	01/25/95	18	UG/KG	U	18	1
Chloroethane	75-00-3	QCBLK57743-1	01/25/95	01/25/95	18	UG/KG	U	18	1
Methylene Chloride	75-09-2	QCBLK57743-1	01/25/95	01/25/95	20	UG/KG	B	9	1
Acetone	67-64-1	QCBLK57743-1	01/25/95	01/25/95	43	UG/KG	BJ	180	1
Carbon Disulfide	75-15-0	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
1,1-Dichloroethene	75-35-4	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
1,1-Dichloroethane	75-34-3	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
1,2-Dichloroethene (total)	540-59-0	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Chloroform	67-66-3	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
1,2-Dichloroethane	107-06-2	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
2-Butanone	78-93-3	QCBLK57743-1	01/25/95	01/25/95	180	UG/KG	U	180	1
1,1,1-Trichloroethane	71-55-6	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Carbon Tetrachloride	56-23-5	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Bromodichloromethane	75-27-4	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
1,2-Dichloropropane	78-87-5	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
cis-1,3-Dichloropropene	10061-01-5	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Trichloroethene	79-01-6	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Dibromochloromethane	124-48-1	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
1,1,2-Trichloroethane	79-00-5	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Benzene	71-43-2	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
trans-1,3-Dichloropropene	10061-02-6	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Bromoform	75-25-2	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
4-Methyl-2-Pentanone	108-10-1	QCBLK57743-1	01/25/95	01/25/95	89	UG/KG	U	89	1
2-Hexanone	591-78-6	QCBLK57743-1	01/25/95	01/25/95	89	UG/KG	U	89	1
Tetrachloroethene	127-18-4	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
1,1,2,2-Tetrachloroethane	79-34-5	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Toluene	108-88-3	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Chlorobenzene	108-90-7	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
EthylBenzene	100-41-4	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Styrene	100-42-5	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Xylene (total)	1330-20-7	QCBLK57743-1	01/25/95	01/25/95	9	UG/KG	U	9	1
Toluene-d8 (SURR)	2037-26-5	QCBLK57743-1	01/25/95	01/25/95	116	%REC			1
Bromofluorobenzene (SURR)	460-00-4	QCBLK57743-1	01/25/95	01/25/95	77	%REC			1
1,2-Dichloroethane-d4 (SURR)	17070-07-0	QCBLK57743-1	01/25/95	01/25/95	95	%REC			1

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Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra Environmental Services

Project: 550.56

Category: VOA-TCL
Method: EPA 8240
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID: B0DMT3

Quanterra ID : 7344-004

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Chloromethane	74-87-3	QCBLK57814-1	01/26/95	01/26/95	31	UG/KG	U	31	1
Bromomethane	74-83-9	QCBLK57814-1	01/26/95	01/26/95	31	UG/KG	U	31	1
Vinyl Chloride	75-01-4	QCBLK57814-1	01/26/95	01/26/95	31	UG/KG	U	31	1
Chloroethane	75-00-3	QCBLK57814-1	01/26/95	01/26/95	31	UG/KG	U	31	1
Methylene Chloride	75-09-2	QCBLK57814-1	01/26/95	01/26/95	74	UG/KG	B	16	1
Acetone	67-64-1	QCBLK57814-1	01/26/95	01/26/95	51	UG/KG	BJ	310	1
Carbon Disulfide	75-15-0	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,1-Dichloroethene	75-35-4	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,1-Dichloroethane	75-34-3	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,2-Dichloroethene (total)	540-59-0	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Chloroform	67-66-3	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,2-Dichloroethane	107-06-2	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
2-Butanone	78-93-3	QCBLK57814-1	01/26/95	01/26/95	310	UG/KG	U	310	1
1,1,1-Trichloroethane	71-55-6	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Carbon Tetrachloride	56-23-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Bromodichloromethane	75-27-4	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,2-Dichloropropane	78-87-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
cis-1,3-Dichloropropene	10061-01-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Trichloroethene	79-01-6	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Dibromochloromethane	124-48-1	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,1,2-Trichloroethane	79-00-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Benzene	71-43-2	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
trans-1,3-Dichloropropene	10061-02-6	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Bromoform	75-25-2	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
4-Methyl-2-Pentanone	108-10-1	QCBLK57814-1	01/26/95	01/26/95	160	UG/KG	U	160	1
2-Hexanone	591-78-6	QCBLK57814-1	01/26/95	01/26/95	160	UG/KG	U	160	1
Tetrachloroethene	127-18-4	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
1,1,2,2-Tetrachloroethane	79-34-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Toluene	108-88-3	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Chlorobenzene	108-90-7	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
EthylBenzene	100-41-4	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Styrene	100-42-5	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Xylene (total)	1330-20-7	QCBLK57814-1	01/26/95	01/26/95	16	UG/KG	U	16	1
Toluene-d8 (SURR)	2037-26-5	QCBLK57814-1	01/26/95	01/26/95	112	%REC			1
Bromofluorobenzene (SURR)	460-00-4	QCBLK57814-1	01/26/95	01/26/95	79	%REC			1
1,2-Dichloroethane-d4 (SURR)	17070-07-0	QCBLK57814-1	01/26/95	01/26/95	95	%REC			1

00074

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0621

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 Date Analyzed: 01/25/95

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	18	U
74-83-9	Bromomethane	18	U
75-01-4	Vinyl Chloride	18	U
75-00-3	Chloroethane	18	U
75-09-2	Methylene Chloride	20	B
67-64-1	Acetone	43	BJ
75-15-0	Carbon Disulfide	9	U
75-35-4	1,1-Dichloroethene	9	U
75-34-3	1,1-Dichloroethane	9	U
540-59-0	1,2-Dichloroethene (total)	9	U
67-66-3	Chloroform	9	U
107-06-2	1,2-Dichloroethane	9	U
78-93-3	2-Butanone	180	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
75-27-4	Bromodichloromethane	9	U
78-87-5	1,2-Dichloropropane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
79-01-6	Trichloroethene	9	U
124-48-1	Dibromochloromethane	9	U
79-00-5	1,1,2-Trichloroethane	9	U
71-43-2	Benzene	9	U
10061-02-6	trans-1,3-Dichloropropene	9	U
75-25-2	Bromoform	9	U
108-10-1	4-Methyl-2-Pentanone	89	U
591-78-6	2-Hexanone	89	U
127-18-4	Tetrachloroethene	9	U
79-34-5	1,1,2,2-Tetrachloroethane	9	U
108-88-3	Toluene	9	U
108-90-7	Chlorobenzene	9	U
100-41-4	Ethylbenzene	9	U
100-42-5	Styrene	9	U
1330-20-7	Xylene (total)	9	U

1E

EPA SAMPLE NO.

B0DMT2

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0621

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 Date Analyzed: 01/25/95

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0635

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 Date Analyzed: 01/26/95

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	31	U
74-83-9	Bromomethane	31	U
75-01-4	Vinyl Chloride	31	U
75-00-3	Chloroethane	31	U
75-09-2	Methylene Chloride	74	B
67-64-1	Acetone	51	BJ
75-15-0	Carbon Disulfide	16	U
75-35-4	1,1-Dichloroethene	16	U
75-34-3	1,1-Dichloroethane	16	U
540-59-0	1,2-Dichloroethene (total)	16	U
67-66-3	Chloroform	16	U
107-06-2	1,2-Dichloroethane	16	U
78-93-3	2-Butanone	310	U
71-55-6	1,1,1-Trichloroethane	16	U
56-23-5	Carbon Tetrachloride	16	U
75-27-4	Bromodichloromethane	16	U
78-87-5	1,2-Dichloropropane	16	U
10061-01-5	cis-1,3-Dichloropropene	16	U
79-01-6	Trichloroethene	16	U
124-48-1	Dibromochloromethane	16	U
79-00-5	1,1,2-Trichloroethane	16	U
71-43-2	Benzene	16	U
10061-02-6	trans-1,3-Dichloropropene	16	U
75-25-2	Bromoform	16	U
108-10-1	4-Methyl-2-Pentanone	160	U
591-78-6	2-Hexanone	160	U
127-18-4	Tetrachloroethene	16	U
79-34-5	1,1,2,2-Tetrachloroethane	16	U
108-88-3	Toluene	16	U
108-90-7	Chlorobenzene	16	U
100-41-4	Ethylbenzene	16	U
100-42-5	Styrene	16	U
1330-20-7	Xylene (total)	16	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0635

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 Date Analyzed: 01/26/95

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

Quanterra
Environmental
Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Semi-VOA-TCL
Method: EPA 8270
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID: BODMT2

Quanterra ID : 7344-002

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Phenol	108-95-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
bis(2-Chloroethyl)Ether	111-44-4	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2-Chlorophenol	95-57-8	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
1,3-Dichlorobenzene	541-73-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
1,4-Dichlorobenzene	106-46-7	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
1,2-Dichlorobenzene	95-50-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2-Methylphenol	95-48-7	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
bis(2-Chloroisopropyl)Ether	108-60-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
4-Methylphenol	106-44-5	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
N-nitroso-di-n-propylamine	621-64-7	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Hexachloroethane	67-72-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Nitrobenzene	98-95-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Isophorone	78-59-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2-Nitrophenol	88-75-5	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2,4-Dimethylphenol	105-67-9	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
bis(2-Chloroethoxy)Methane	111-91-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2,4-Dichlorophenol	120-83-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
1,2,4-Trichlorobenzene	120-82-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Naphthalene	91-20-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
4-Chloroaniline	106-47-8	QCBLK57260-1	01/20/95	01/23/95	2300	UG/KG	U	2300	1
Hexachlorobutadiene	87-68-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
4-Chloro-3-Methylphenol	59-50-7	QCBLK57260-1	01/20/95	01/23/95	2300	UG/KG	U	2300	1
2-Methylnaphthalene	91-57-6	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Hexachlorocyclopentadiene	77-47-4	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2,4,6-Trichlorophenol	88-06-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2,4,5-Trichlorophenol	95-95-4	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2-Chloronaphthalene	91-58-7	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2-Nitroaniline	88-74-4	QCBLK57260-1	01/20/95	01/23/95	5900	UG/KG	U	5900	1
DimethylPhthalate	131-11-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Acenaphthylene	208-96-8	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2,6-Dinitrotoluene	606-20-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
3-Nitroaniline	99-09-2	QCBLK57260-1	01/20/95	01/23/95	5900	UG/KG	U	5900	1
Acenaphthene	83-32-9	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2,4-Dinitrophenol	51-28-5	QCBLK57260-1	01/20/95	01/23/95	5900	UG/KG	U	5900	1
4-Nitrophenol	100-02-7	QCBLK57260-1	01/20/95	01/23/95	5900	UG/KG	U	5900	1
Dibenzofuran	132-64-9	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
2,4-Dinitrotoluene	121-14-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Diethylphthalate	84-66-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
4-Chlorophenyl-PhenylEther	7005-72-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Fluorene	86-73-7	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
4-Nitroaniline	100-01-6	QCBLK57260-1	01/20/95	01/23/95	2300	UG/KG	U	2300	1
4,6-Dinitro-2-Methylphenol	534-52-1	QCBLK57260-1	01/20/95	01/23/95	5900	UG/KG	U	5900	1
n-Nitrosodiphenylamine (1)	86-30-6	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
4-Bromophenyl-Phenyl Ether	101-55-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Hexachlorobenzene	118-74-1	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Pentachlorophenol	87-86-5	QCBLK57260-1	01/20/95	01/23/95	5900	UG/KG	U	5900	1
Phenanthrene	85-01-8	QCBLK57260-1	01/20/95	01/23/95	440	UG/KG	J	1200	1
Anthracene	120-12-7	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Carbazole	86-74-8	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Di-N-Butylphthalate	84-74-2	QCBLK57260-1	01/20/95	01/23/95	170	UG/KG	J	1200	1
Fluoranthene	206-44-0	QCBLK57260-1	01/20/95	01/23/95	590	UG/KG	J	1200	1
Pyrene	129-00-0	QCBLK57260-1	01/20/95	01/23/95	570	UG/KG	J	1200	1
ButylBenzylPhthalate	85-68-7	QCBLK57260-1	01/20/95	01/23/95	820	UG/KG	BJ	1200	1
3,3'-Dichlorobenzidine	91-94-1	QCBLK57260-1	01/20/95	01/23/95	2300	UG/KG	U	2300	1
Benzo(a)Anthracene	56-55-3	QCBLK57260-1	01/20/95	01/23/95	180	UG/KG	J	1200	1
Chrysene	218-01-9	QCBLK57260-1	01/20/95	01/23/95	220	UG/KG	J	1200	1
bis(2-Ethylhexyl)Phthalate	117-81-7	QCBLK57260-1	01/20/95	01/23/95	81	UG/KG	J	1200	1
di-N-OctylPhthalate	117-84-0	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Benzo(b)Fluoranthene	205-99-2	QCBLK57260-1	01/20/95	01/23/95	420	UG/KG	J	1200	1
Benzo(k)Fluoranthene	207-08-9	QCBLK57260-1	01/20/95	01/23/95	130	UG/KG	J	1200	1
Benzo(a)Pyrene	50-32-8	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1

Quanterra Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Semi-VOA-TCL
Method: EPA 8270
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID: BODMT2

Quanterra ID : 7344-002

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Indeno(1,2,3-CD)Pyrene	193-39-5	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Dibenz(a,h)Anthracene	53-70-3	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Benzo(g,h,i)Perylene	191-24-2	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	U	1200	1
Aldol Condensation-1	TIC-108	QCBLK57260-1	01/20/95	01/23/95	25000	UG/KG	BJ		1
Aldol Condensation-2	TIC-109	QCBLK57260-1	01/20/95	01/23/95	2600	UG/KG	BJ		1
Unknown-1	TIC-32	QCBLK57260-1	01/20/95	01/23/95	240	UG/KG	J		1
Unknown-2	TIC-33	QCBLK57260-1	01/20/95	01/23/95	2800	UG/KG	J		1
Unknown Alkane-1	TIC-42	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	J		1
Unknown Alkane-2	TIC-43	QCBLK57260-1	01/20/95	01/23/95	320	UG/KG	J		1
Unknown Alkane-3	TIC-142	QCBLK57260-1	01/20/95	01/23/95	290	UG/KG	J		1
Unknown-3	TIC-34	QCBLK57260-1	01/20/95	01/23/95	390	UG/KG	J		1
Unknown C12H6C14-1	TIC-402	QCBLK57260-1	01/20/95	01/23/95	220	UG/KG	J		1
Unknown C12H6C14-2	TIC-403	QCBLK57260-1	01/20/95	01/23/95	340	UG/KG	J		1
Unknown C12H5C15-1	TIC-330	QCBLK57260-1	01/20/95	01/23/95	1400	UG/KG	J		1
Unknown C12H5C15-2	TIC-331	QCBLK57260-1	01/20/95	01/23/95	590	UG/KG	J		1
Unknown C12H4C16-1	TIC-335	QCBLK57260-1	01/20/95	01/23/95	560	UG/KG	J		1
Unknown C12H4C16-2	TIC-336	QCBLK57260-1	01/20/95	01/23/95	990	UG/KG	J		1
Unknown C12H5C15-3	TIC-332	QCBLK57260-1	01/20/95	01/23/95	900	UG/KG	J		1
Unknown C12H4C16-3	TIC-337	QCBLK57260-1	01/20/95	01/23/95	1100	UG/KG	J		1
Unknown C12H4C16-4	TIC-338	QCBLK57260-1	01/20/95	01/23/95	1200	UG/KG	J		1
Unknown C12H3C17-1	TIC-348	QCBLK57260-1	01/20/95	01/23/95	500	UG/KG	J		1
Unknown C12H3C17-2	TIC-349	QCBLK57260-1	01/20/95	01/23/95	650	UG/KG	J		1
Unknown-4	TIC-35	QCBLK57260-1	01/20/95	01/23/95	610	UG/KG	J		1
Unknown-5	TIC-36	QCBLK57260-1	01/20/95	01/23/95	1000	UG/KG	J		1
Unknown-6	TIC-37	QCBLK57260-1	01/20/95	01/23/95	1100	UG/KG	J		1
Nitrobenzene-d5	4165-60-0	QCBLK57260-1	01/20/95	01/23/95	83	%REC			1
2-Fluorobiphenyl	321-60-8	QCBLK57260-1	01/20/95	01/23/95	73	%REC			1
Terphenyl-d14	1718-51-0	QCBLK57260-1	01/20/95	01/23/95	95	%REC			1
Phenol-d5	13127-88-3	QCBLK57260-1	01/20/95	01/23/95	92	%REC			1
2-Fluorophenol	367-12-4	QCBLK57260-1	01/20/95	01/23/95	83	%REC			1
2,4,6-Tribromophenol	118-79-6	QCBLK57260-1	01/20/95	01/23/95	65	%REC			1

9613497.1279

Quanterra Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Semi-VOA-TCL
Method: EPA 8270
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID: BODMT3

Quanterra ID : 7344-004

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Phenol	108-95-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
bis(2-Chloroethyl)Ether	111-44-4	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2-Chlorophenol	95-57-8	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
1,3-Dichlorobenzene	541-73-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
1,4-Dichlorobenzene	106-46-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
1,2-Dichlorobenzene	95-50-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2-Methylphenol	95-48-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
bis(2-Chloroisopropyl)Ether	108-60-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
4-Methylphenol	106-44-5	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
N-nitroso-di-n-propylamine	621-64-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Hexachloroethane	67-72-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Nitrobenzene	98-95-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Isophorone	78-59-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2-Nitrophenol	88-75-5	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2,4-Dimethylphenol	105-67-9	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
bis(2-Chloroethoxy)Methane	111-91-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2,4-Dichlorophenol	120-83-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
1,2,4-Trichlorobenzene	120-82-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Naphthalene	91-20-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
4-Chloroaniline	106-47-8	QCBLK57260-1	01/20/95	01/23/95	4100	UG/KG	U	4100	1
Hexachlorobutadiene	87-68-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
4-Chloro-3-Methylphenol	59-50-7	QCBLK57260-1	01/20/95	01/23/95	4100	UG/KG	U	4100	1
2-Methylnaphthalene	91-57-6	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Hexachlorocyclopentadiene	77-47-4	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2,4,6-Trichlorophenol	88-06-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2,4,5-Trichlorophenol	95-95-4	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2-Chloronaphthalene	91-58-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2-Nitroaniline	88-74-4	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG	U	10000	1
DimethylPhthalate	131-11-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Acenaphthylene	208-96-8	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2,6-Dinitrotoluene	606-20-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
3-Nitroaniline	99-09-2	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG	U	10000	1
Acenaphthene	83-32-9	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2,4-Dinitrophenol	51-28-5	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG	U	10000	1
4-Nitrophenol	100-02-7	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG	U	10000	1
Dibenzofuran	132-64-9	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
2,4-Dinitrotoluene	121-14-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Diethylphthalate	84-66-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
4-Chlorophenyl-PhenylEther	7005-72-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Fluorene	86-73-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
4-Nitroaniline	100-01-6	QCBLK57260-1	01/20/95	01/23/95	4100	UG/KG	U	4100	1
4,6-Dinitro-2-Methylphenol	534-52-1	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG	U	10000	1
n-Nitrosodiphenylamine (1)	86-30-6	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
4-Bromophenyl-Phenyl Ether	101-55-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Hexachlorobenzene	118-74-1	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Pentachlorophenol	87-86-5	QCBLK57260-1	01/20/95	01/23/95	10000	UG/KG	U	10000	1
Phenanthrene	85-01-8	QCBLK57260-1	01/20/95	01/23/95	470	UG/KG	J	2100	1
Anthracene	120-12-7	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Carbazole	86-74-8	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Di-N-Butylphthalate	84-74-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Fluoranthene	206-44-0	QCBLK57260-1	01/20/95	01/23/95	940	UG/KG	J	2100	1
Pyrene	129-00-0	QCBLK57260-1	01/20/95	01/23/95	820	UG/KG	J	2100	1
ButylBenzylPhthalate	85-68-7	QCBLK57260-1	01/20/95	01/23/95	1400	UG/KG	BJ	2100	1
3,3'-Dichlorobenzidine	91-94-1	QCBLK57260-1	01/20/95	01/23/95	4100	UG/KG	U	4100	1
Benzo(a)Anthracene	56-55-3	QCBLK57260-1	01/20/95	01/23/95	340	UG/KG	J	2100	1
Chrysene	218-01-9	QCBLK57260-1	01/20/95	01/23/95	400	UG/KG	J	2100	1
bis(2-Ethylhexyl)Phthalate	117-81-7	QCBLK57260-1	01/20/95	01/23/95	130	UG/KG	J	2100	1
di-N-OctylPhthalate	117-84-0	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Benzo(b)Fluoranthene	205-99-2	QCBLK57260-1	01/20/95	01/23/95	580	UG/KG	J	2100	1
Benzo(k)Fluoranthene	207-08-9	QCBLK57260-1	01/20/95	01/23/95	220	UG/KG	J	2100	1
Benzo(a)Pyrene	50-32-8	QCBLK57260-1	01/20/95	01/23/95	290	UG/KG	J	2100	1

00280

Quanterra
Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Semi-VOA-TCL
Method: EPA 8270
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID: BODMT3

Quanterra ID : 7344-004

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Indeno(1,2,3-CD)Pyrene	193-39-5	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Dibenz(a,h)Anthracene	53-70-3	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Benzo(g,h,i)Perylene	191-24-2	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	U	2100	1
Aldol Condensation	TIC-4	QCBLK57260-1	01/20/95	01/23/95	36000	UG/KG	BJ		1
Unknown-1	TIC-32	QCBLK57260-1	01/20/95	01/23/95	240	UG/KG	J		1
Unknown-2	TIC-33	QCBLK57260-1	01/20/95	01/23/95	4600	UG/KG	J		1
Unknown Alkane-1	TIC-42	QCBLK57260-1	01/20/95	01/23/95	2100	UG/KG	J		1
Unknown-3	TIC-34	QCBLK57260-1	01/20/95	01/23/95	260	UG/KG	J		1
Unknown Alkane-2	TIC-43	QCBLK57260-1	01/20/95	01/23/95	230	UG/KG	J		1
Unknown-4	TIC-35	QCBLK57260-1	01/20/95	01/23/95	620	UG/KG	J		1
Unknown-5	TIC-36	QCBLK57260-1	01/20/95	01/23/95	360	UG/KG	J		1
Unknown-6	TIC-37	QCBLK57260-1	01/20/95	01/23/95	230	UG/KG	J		1
Unknown-7	TIC-7	QCBLK57260-1	01/20/95	01/23/95	230	UG/KG	J		1
Unknown-8	TIC-8	QCBLK57260-1	01/20/95	01/23/95	270	UG/KG	J		1
Unknown-9	TIC-9	QCBLK57260-1	01/20/95	01/23/95	280	UG/KG	J		1
Unknown-10	TIC-10	QCBLK57260-1	01/20/95	01/23/95	600	UG/KG	J		1
Unknown-11	TIC-11	QCBLK57260-1	01/20/95	01/23/95	440	UG/KG	J		1
Unknown-12	TIC-12	QCBLK57260-1	01/20/95	01/23/95	360	UG/KG	J		1
Unknown-13	TIC-13	QCBLK57260-1	01/20/95	01/23/95	490	UG/KG	J		1
Unknown-14	TIC-14	QCBLK57260-1	01/20/95	01/23/95	410	UG/KG	J		1
Unknown-15	TIC-15	QCBLK57260-1	01/20/95	01/23/95	700	UG/KG	J		1
Nitrobenzene-d5	4165-60-0	QCBLK57260-1	01/20/95	01/23/95	77	%REC			1
2-Fluorobiphenyl	321-60-8	QCBLK57260-1	01/20/95	01/23/95	69	%REC			1
Terphenyl-d14	1718-51-0	QCBLK57260-1	01/20/95	01/23/95	76	%REC			1
Phenol-d5	13127-88-3	QCBLK57260-1	01/20/95	01/23/95	86	%REC			1
2-Fluorophenol	367-12-4	QCBLK57260-1	01/20/95	01/23/95	70	%REC			1
2,4,6-Tribromophenol	118-79-6	QCBLK57260-1	01/20/95	01/23/95	59	%REC			1

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	1200	U
111-44-4	bis(2-Chloroethyl)Ether	1200	U
95-57-8	2-Chlorophenol	1200	U
541-73-1	1,3-Dichlorobenzene	1200	U
106-46-7	1,4-Dichlorobenzene	1200	U
95-50-1	1,2-Dichlorobenzene	1200	U
95-48-7	2-Methylphenol	1200	U
108-60-1	2,2'-oxybis(1-Chloropropane)	1200	U
106-44-5	4-Methylphenol	1200	U
621-64-7	N-Nitroso-Di-n-Propylamine	1200	U
67-72-1	Hexachloroethane	1200	U
98-95-3	Nitrobenzene	1200	U
78-59-1	Isophorone	1200	U
88-75-5	2-Nitrophenol	1200	U
105-67-9	2,4-Dimethylphenol	1200	U
111-91-1	bis(2-Chloroethoxy)Methane	1200	U
120-83-2	2,4-Dichlorophenol	1200	U
120-82-1	1,2,4-Trichlorobenzene	1200	U
91-20-3	Naphthalene	1200	U
106-47-8	4-Chloroaniline	2300	U
87-68-3	Hexachlorobutadiene	1200	U
59-50-7	4-Chloro-3-Methylphenol	2300	U
91-57-6	2-Methylnaphthalene	1200	U
77-47-4	Hexachlorocyclopentadiene	1200	U
88-06-2	2,4,6-Trichlorophenol	1200	U
95-95-4	2,4,5-Trichlorophenol	1200	U
91-58-7	2-Chloronaphthalene	1200	U
88-74-4	2-Nitroaniline	5900	U
131-11-3	Dimethyl Phthalate	1200	U
208-96-8	Acenaphthylene	1200	U
606-20-2	2,6-Dinitrotoluene	1200	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	5900	U
83-32-9	Acenaphthene	1200	U
51-28-5	2,4-Dinitrophenol	5900	U
100-02-7	4-Nitrophenol	5900	U
132-64-9	Dibenzofuran	1200	U
121-14-2	2,4-Dinitrotoluene	1200	U
84-66-2	Diethylphthalate	1200	U
7005-72-3	4-Chlorophenyl-phenylether	1200	U
86-73-7	Fluorene	1200	U
100-01-6	4-Nitroaniline	2300	U
534-52-1	4,6-Dinitro-2-Methylphenol	5900	U
86-30-6	N-Nitrosodiphenylamine (1)	1200	U
101-55-3	4-Bromophenyl-phenylether	1200	U
118-74-1	Hexachlorobenzene	1200	U
87-86-5	Pentachlorophenol	5900	U
85-01-8	Phenanthrene	440	J
120-12-7	Anthracene	430	J
86-74-8	Carbazole	1200	U
84-74-2	Di-n-Butylphthalate	170	J
206-44-0	Fluoranthene	590	J
129-00-0	Pyrene	570	J
85-68-7	Butylbenzylphthalate	820	BJ
91-94-1	3,3'-Dichlorobenzidine	2300	U
56-55-3	Benzo(a)Anthracene	180	J
218-01-9	Chrysene	220	J
117-81-7	bis(2-Ethylhexyl)Phthalate	81	J
117-84-0	Di-n-Octyl Phthalate	1200	U
205-99-2	Benzo(b)Fluoranthene	420	J
207-08-9	Benzo(k)Fluoranthene	130	J
50-32-8	Benzo(a)Pyrene	1200	U
193-39-5	Indeno(1,2,3-cd)Pyrene	1200	U
53-70-3	Dibenz(a,h)Anthracene	1200	U
191-24-2	Benzo(g,h,i)Perylene	1200	U

(1) - Cannot be separated from Diphenylamine

1F

EPA SAMPLE NO.

B0DMT2

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 22

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	0	Aldol Condensation	4.64	25000	ABJ
2.		Aldol Condensation	4.70	2600	ABJ
3.		UNKNOWN	16.77	240	J
4.		UNKNOWN	18.59	2800	J
5.		Unknown Alkane	18.84	1200	J
6.		Unknown Alkane	18.94	320	J
7.		Unknown Alkane	19.44	290	J
8.		UNKNOWN	20.50	390	J
9.		Unknown C12H6Cl4	22.92	220	J
10.		Unknown C12H6Cl4	23.02	340	J
11.		Unknown C12H5Cl5	23.53	1400	J
12.		Unknown C12H5Cl5	24.07	590	J
13.		Unknown C12H4Cl6	24.46	560	J
14.		Unknown C12H4Cl6	24.70	990	J
15.		Unknown C12H5Cl5	24.79	900	J
16.		Unknown C12H4Cl6	25.22	1100	J
17.		Unknown C12H4Cl6	25.75	1200	J
18.		Unknown C12H3Cl7	26.02	500	J
19.		Unknown C12H3Cl7	27.03	650	J
20.		UNKNOWN	28.32	610	J
21.		UNKNOWN	29.60	1000	J
22.		UNKNOWN	29.88	1100	J

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	10000	U
83-32-9	Acenaphthene	2100	U
51-28-5	2,4-Dinitrophenol	10000	U
100-02-7	4-Nitrophenol	10000	U
132-64-9	Dibenzofuran	2100	U
121-14-2	2,4-Dinitrotoluene	2100	U
84-66-2	Diethylphthalate	2100	U
7005-72-3	4-Chlorophenyl-phenylether	2100	U
86-73-7	Fluorene	2100	U
100-01-6	4-Nitroaniline	4100	U
534-52-1	4,6-Dinitro-2-Methylphenol	10000	U
86-30-6	N-Nitrosodiphenylamine (1)	2100	U
101-55-3	4-Bromophenyl-phenylether	2100	U
118-74-1	Hexachlorobenzene	2100	U
87-86-5	Pentachlorophenol	10000	U
85-01-8	Phenanthrene	470	J
120-12-7	Anthracene	460	J
86-74-8	Carbazole	2100	U
84-74-2	Di-n-Butylphthalate	2100	U
206-44-0	Fluoranthene	940	J
129-00-0	Pyrene	820	J
85-68-7	Butylbenzylphthalate	1400	BJ
91-94-1	3,3'-Dichlorobenzidine	4100	U
56-55-3	Benzo(a)Anthracene	340	J
218-01-9	Chrysene	400	J
117-81-7	bis(2-Ethylhexyl)Phthalate	130	J
117-84-0	Di-n-Octyl Phthalate	2100	U
205-99-2	Benzo(b)Fluoranthene	580	J
207-08-9	Benzo(k)Fluoranthene	220	J
50-32-8	Benzo(a)Pyrene	290	J
193-39-5	Indeno(1,2,3-cd)Pyrene	2100	U
53-70-3	Dibenz(a,h)Anthracene	2100	U
191-24-2	Benzo(g,h,i)Perylene	2100	U

(1) - Cannot be separated from Diphenylamine

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	2100	U
111-44-4	bis(2-Chloroethyl)Ether	2100	U
95-57-8	2-Chlorophenol	2100	U
541-73-1	1,3-Dichlorobenzene	2100	U
106-46-7	1,4-Dichlorobenzene	2100	U
95-50-1	1,2-Dichlorobenzene	2100	U
95-48-7	2-Methylphenol	2100	U
108-60-1	2,2'-oxybis(1-Chloropropane)	2100	U
106-44-5	4-Methylphenol	2100	U
621-64-7	N-Nitroso-Di-n-Propylamine	2100	U
67-72-1	Hexachloroethane	2100	U
98-95-3	Nitrobenzene	2100	U
78-59-1	Isophorone	2100	U
88-75-5	2-Nitrophenol	2100	U
105-67-9	2,4-Dimethylphenol	2100	U
111-91-1	bis(2-Chloroethoxy)Methane	2100	U
120-83-2	2,4-Dichlorophenol	2100	U
120-82-1	1,2,4-Trichlorobenzene	2100	U
91-20-3	Naphthalene	2100	U
106-47-8	4-Chloroaniline	4100	U
87-68-3	Hexachlorobutadiene	2100	U
59-50-7	4-Chloro-3-Methylphenol	4100	U
91-57-6	2-Methylnaphthalene	2100	U
77-47-4	Hexachlorocyclopentadiene	2100	U
88-06-2	2,4,6-Trichlorophenol	2100	U
95-95-4	2,4,5-Trichlorophenol	2100	U
91-58-7	2-Chloronaphthalene	2100	U
88-74-4	2-Nitroaniline	10000	U
131-11-3	Dimethyl Phthalate	2100	U
208-96-8	Acenaphthylene	2100	U
606-20-2	2,6-Dinitrotoluene	2100	U

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 18

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	0	Aldol Condensation	4.65	36000	ABJ
2.		UNKNOWN	16.77	240	J
3.		UNKNOWN	18.59	4600	J
4.		Unknown Alkane	18.85	2100	J
5.		UNKNOWN	18.94	260	J
6.		Unknown Alkane	19.45	230	J
7.		UNKNOWN	20.50	620	J
8.		UNKNOWN	20.97	360	J
9.		UNKNOWN	21.82	230	J
10.		UNKNOWN	26.55	230	J
11.		UNKNOWN	28.12	270	J
12.		UNKNOWN	28.30	280	J
13.		UNKNOWN	29.56	600	J
14.		UNKNOWN	30.48	440	J
15.		UNKNOWN	31.19	360	J
16.		UNKNOWN	31.39	490	J
17.		UNKNOWN	31.75	410	J
18.		UNKNOWN	32.01	700	J

ITAS - ST. LOUIS

NON-DECANTED % SOLIDS/% MOISTURE

% Solids

Project: 589.01 550.57 550.56 522.05

Analyst: S. Pope
Chkd By: R. Patterson
Batch No: 57361
Method No: SL4005

Date: 01-20-95
Date: 01-23-95

In Date: 01-20-95 Time: 3:40 PM
Out Date: 01-23-95 Time: 7:45 AM
Oven Temp: 105°C
Balance #: AE200

Sample No	Pan No	Pan/A Weight	Wet/B Soil + Pan	Dry/C Soil + Pan	Dry/C1 Soil + Pan	Diff C1-C	Dry/C2 Soil + Pan	Diff C2-C1	Dry/C3 Soil + Pan	Diff C3-C2	% Solids
7335-001	1	1.5832	12.0632	10.0805							
-002	2	1.5587	11.2113	9.5001							
-003	3	1.5601	12.7497	10.6153							
-004	4	1.5619	11.8959	9.7204							
-005	5	1.5696	12.4069	10.2507							
-006	6	1.5669	11.3003	9.5116							
-007	7	1.5616	11.1991	9.4121							
-008 DUP	8	1.5707	11.4113	9.8394							
7336-001	9	1.5612	11.1209	9.3104							
-004	10	1.5665	11.3763	9.5104							
-005	11	1.5618	13.9413	11.6474							
-006	12	1.5810	13.1031	10.3135							
-007	13	1.5742	11.4406	9.6187							
-008	14	1.5805	12.3828	10.0375							
-009	15	1.5821	11.8398	9.6288							
-010	16	1.5824	11.0103	9.2686							
011	17	1.5987	13.4339	11.4220							
-012	18	1.5813	12.4865	10.4608							
-013	19	1.5718	11.3406	9.7921							
-014	20	1.5773	11.1481	9.2652							

00499 Calculation $\frac{C}{A} \times 100 = \%$ SOLIDS

ITAS - ST. LOUIS

NON-DECANTED % SOLIDS/% MOISTURE

% Solids

Analyst	S. Poppe			Project	589.01 550.51 550.56 522.05
Chk'd By	R. Patterson	Date	01-20-95	In Date	01-20-95
Batch No	57361	Date	01-23-95	Out Date	01-23-95
Method No	SC4005			Oven Temp	105°C
				Balance #	AE200

In Date Time: 3:40 PM; Out Date Time: 7:45 AM

Sample No	Pan No	Pan/A Weight	Wet/B Soil+Pan	Dry/C Soil+Pan	Dry/C1 Soil+Pan	Diff C1-C	Dry/C2 Soil+Pan	Diff C2-C1	Dry/C3 Soil+Pan	Diff C3-C2	% Solids
7337-001	21	1.5777	13.0181	11.0621							
-002	22	1.5754	13.6446	11.3021							
-003	23	1.5828	13.0802	10.7096							
-004	24	1.5866	11.3243	8.9141							
-005	25	1.5779	12.2091	11.3514							
-006	26	1.5799	11.5481	9.5063							
-007	27	1.5854	12.6073	11.1845							
7337-007RP	28	1.5833	12.0902	10.6821							
7274-001	29	1.5838	11.6936	10.7568							
7344-001	30	1.5917	12.2002	12.1973							
-002	31	1.5877	11.6851	7.2917							
-003	32	1.5491	11.4998	6.3386							
-004	33	1.5925	11.4273	4.7668							
-005	34	1.5890	11.5018	4.5669							
-006	35	1.5835	11.5159	4.5736							
-007	36	1.5802	12.9811	9.5825							
7342-014	37	1.5460	11.2876	3.9633							
-015	38	1.6224	12.1978	4.0929							
-016	39	1.5662	13.5305	11.1059							

Steven Poppe 01-23-95

00500 Calculation: $\frac{C-A}{B-A} \times 100 = $ % SOLIDS

9613497.1289

Quanterra Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Pesticide/PCBs
Method: EPA 8080
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID: BODMT2

Quanterra ID : 7344-002

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
alpha-BHC	319-84-6	QCBLK57279-1	01/20/95	01/25/95	1.8	UG/KG	U	1.8	1
beta-BHC	319-85-7	QCBLK57279-1	01/20/95	01/25/95	3.5	UG/KG	U	3.5	1
delta-BHC	319-86-8	QCBLK57279-1	01/20/95	01/25/95	5.3	UG/KG	U	5.3	1
gamma-BHC (Lindane)	58-89-9	QCBLK57279-1	01/20/95	01/25/95	4.5	UG/KG		2.3	1
Heptachlor	76-44-8	QCBLK57279-1	01/20/95	01/25/95	1.8	UG/KG	U	1.8	1
Aldrin	309-00-2	QCBLK57279-1	01/20/95	01/25/95	8.2	UG/KG		2.3	1
Heptachlor Epoxide	1024-57-3	QCBLK57279-1	01/20/95	01/25/95	49	UG/KG	U	49	1
Endosulfan I	959-98-8	QCBLK57279-1	01/20/95	01/25/95	8.3	UG/KG	U	8.3	1
Dieldrin	60-57-1	QCBLK57279-1	01/20/95	01/25/95	1.2	UG/KG	U	1.2	1
4,4'-DDE	72-55-9	QCBLK57279-1	01/20/95	01/25/95	25	UG/KG	UX	25	1
Endrin	72-20-8	QCBLK57279-1	01/20/95	01/25/95	140	UG/KG	UX	140	1
Endosulfan II	33213-65-9	QCBLK57279-1	01/20/95	01/25/95	45	UG/KG	UX	45	1
4,4'-DDD	72-54-8	QCBLK57279-1	01/20/95	01/25/95	6.5	UG/KG	U	6.5	1
Endosulfan Sulfate	1031-07-8	QCBLK57279-1	01/20/95	01/25/95	39	UG/KG	U	39	1
4,4'-DDT	50-29-3	QCBLK57279-1	01/20/95	01/25/95	170	UG/KG	UX	170	1
Methoxychlor	72-43-5	QCBLK57279-1	01/20/95	01/25/95	100	UG/KG	U	100	1
Endrin Aldehyde	7421-93-4	QCBLK57279-1	01/20/95	01/25/95	54	UG/KG	UX	54	1
Chlordane	57-74-9	QCBLK57279-1	01/20/95	01/25/95	8.3	UG/KG	U	8.3	1
Toxaphene	8001-35-2	QCBLK57279-1	01/20/95	01/25/95	140	UG/KG	U	140	1
Aroclor-1016	12674-11-2	QCBLK57279-1	01/20/95	01/25/95	39	UG/KG	U	39	1
Aroclor-1221	11104-28-2	QCBLK57279-1	01/20/95	01/25/95	59	UG/KG	U	59	1
Aroclor-1232	11141-16-5	QCBLK57279-1	01/20/95	01/25/95	59	UG/KG	U	59	1
Aroclor-1242	53469-21-9	QCBLK57279-1	01/20/95	01/25/95	39	UG/KG	U	39	1
Aroclor-1248	12672-29-6	QCBLK57279-1	01/20/95	01/25/95	59	UG/KG	U	59	1
Aroclor-1254	11097-69-1	QCBLK57279-1	01/20/95	02/02/95	2300	UG/KG		590	10
Aroclor-1260	11096-82-5	QCBLK57279-1	01/20/95	02/02/95	1800	UG/KG		590	10
DBC	1770-80-5	QCBLK57279-1	01/20/95	01/25/95	72	%REC			1

005526

Quanterra
Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Pesticide/PCBs
Method: EPA 8080
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID: BODMT3

Quanterra ID : 7344-004

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
alpha-BHC	319-84-6	QCBLK57279-1	01/20/95	01/25/95	3.1	UG/KG	U	3.1	1
beta-BHC	319-85-7	QCBLK57279-1	01/20/95	01/25/95	6.2	UG/KG	U	6.2	1
delta-BHC	319-86-8	QCBLK57279-1	01/20/95	01/25/95	9.3	UG/KG	U	9.3	1
gamma-BHC (Lindane)	58-89-9	QCBLK57279-1	01/20/95	01/25/95	4.1	UG/KG	U	4.1	1
Heptachlor	76-44-8	QCBLK57279-1	01/20/95	01/25/95	3.1	UG/KG	U	3.1	1
Aldrin	309-00-2	QCBLK57279-1	01/20/95	01/25/95	36	UG/KG		4.1	1
Heptachlor Epoxide	1024-57-3	QCBLK57279-1	01/20/95	01/25/95	86	UG/KG	U	86	1
Endosulfan I	959-98-8	QCBLK57279-1	01/20/95	01/25/95	14	UG/KG	U	14	1
Dieldrin	60-57-1	QCBLK57279-1	01/20/95	01/25/95	2.1	UG/KG	U	2.1	1
4,4'-DDE	72-55-9	QCBLK57279-1	01/20/95	01/25/95	82	UG/KG	UX	82	1
Endrin	72-20-8	QCBLK57279-1	01/20/95	01/25/95	440	UG/KG	UX	440	1
Endosulfan II	33213-65-9	QCBLK57279-1	01/20/95	01/25/95	55	UG/KG	UX	55	1
4,4'-DDD	72-54-8	QCBLK57279-1	01/20/95	01/25/95	24	UG/KG	UX	24	1
Endosulfan Sulfate	1031-07-8	QCBLK57279-1	01/20/95	01/25/95	68	UG/KG	U	68	1
4,4'-DDT	50-29-3	QCBLK57279-1	01/20/95	01/25/95	190	UG/KG	UX	190	1
Methoxychlor	72-43-5	QCBLK57279-1	01/20/95	01/25/95	180	UG/KG	U	180	1
Endrin Aldehyde	7421-93-4	QCBLK57279-1	01/20/95	01/25/95	110	UG/KG	UX	110	1
Chlordane	57-74-9	QCBLK57279-1	01/20/95	01/25/95	14	UG/KG	U	14	1
Toxaphene	8001-35-2	QCBLK57279-1	01/20/95	01/25/95	250	UG/KG	U	250	1
Aroclor-1016	12674-11-2	QCBLK57279-1	01/20/95	01/25/95	68	UG/KG	U	68	1
Aroclor-1221	11104-28-2	QCBLK57279-1	01/20/95	01/25/95	100	UG/KG	U	100	1
Aroclor-1232	11141-16-5	QCBLK57279-1	01/20/95	01/25/95	100	UG/KG	U	100	1
Aroclor-1242	53469-21-9	QCBLK57279-1	01/20/95	01/25/95	68	UG/KG	U	68	1
Aroclor-1248	12672-29-6	QCBLK57279-1	01/20/95	01/25/95	100	UG/KG	U	100	1
Aroclor-1254	11097-69-1	QCBLK57279-1	01/20/95	01/24/95	9800	UG/KG		2500	25
Aroclor-1260	11096-82-5	QCBLK57279-1	01/20/95	01/24/95	7500	UG/KG		2500	25
DBC	1770-80-5	QCBLK57279-1	01/20/95	01/25/95	66	%REC			1

9613497.1291

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT2

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.0 (g/ml) g Lab File ID: _____

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 44 dec. _____ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01-25-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
319-84-6	alpha-BHC	1.8	U
319-85-7	beta-BHC	3.5	U
319-86-8	delta-BHC	5.3	U
58-89-9	gamma-BHC (Lindane)	4.5	
76-44-8	Heptachlor	1.8	U
309-00-2	Aldrin	8.2	
1024-57-3	Heptachlor epoxide	49	U
959-98-8	Endosulfan I	8.3	U
60-57-1	Dieldrin	1.2	U
72-55-9	4,4'-DDE	25	UX
72-20-8	Endrin	140	UX
33213-65-9	Endosulfan II	45	UX
72-54-8	4,4'-DDD	6.5	U
1031-07-8	Endosulfan sulfate	39	U
50-29-3	4,4'-DDT	170	UX
72-43-5	Methoxychlor	100	U
53494-70-5	Endrin Aldehyde	54	UX
57-74-9	Tech. Chlordane	8.3	U
8001-35-2	Toxaphene	140	U
11104-28-2	Aroclor-1221	59	U
11141-28-2	Aroclor-1232	59	U
53469-21-9/12674-11-2	Aroclor-1242/1016	39	U
12672-29-6	Aroclor-1248	59	U
11097-57-4	Aroclor-1254		SD
11096-82-5	Aroclor-1260		SD

U: Concentration of analyte is less than the value given.
SD: See dilution
X: Elevated detection limit due to PCB interference.

9613497.1292

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT2DL

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: ______ SAS No.: ______ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002DL

Sample wt/vol: 30.0 (g/ml) g Lab File ID: ______

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 44 dec. ______ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02-02-95

GPC Cleanup: (Y/N) N pH: ______ Dilution Factor: 10

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
11104-28-2	Aroclor-1221	590	U
11141-28-2	Aroclor-1232	590	U
53469-21-9/12674-11-2	Aroclor-1242/1016	390	U
12672-29-6	Aroclor-1248	590	U
11097-57-4	Aroclor-1254	2300	
11096-82-5	Aroclor-1260	1800	

U: Concentration of analyte is less than the value given.

9613497.1293

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT3

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.0 (g/ml) g Lab File ID: .

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 68 dec. _____ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01-25-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
319-84-6	alpha-BHC	3.1	U
319-85-7	beta-BHC	6.2	U
319-86-8	delta-BHC	9.3	U
58-89-9	gamma-BHC (Lindane)	4.1	U
76-44-8	Heptachlor	3.1	U
309-00-2	Aldrin	36	
1024-57-3	Heptachlor epoxide	86	U
959-98-8	Endosulfan I	14	U
60-57-1	Dieldrin	2.1	U
72-55-9	4,4'-DDE	82	UX
72-20-8	Endrin	440	UX
33213-65-9	Endosulfan II	55	UX
72-54-8	4,4'-DDD	24	UX
1031-07-8	Endosulfan sulfate	68	U
50-29-3	4,4'-DDT	190	UX
72-43-5	Methoxychlor	180	U
53494-70-5	Endrin Aldehyde	110	UX
57-74-9	Tech. Chlordane	14	U
8001-35-2	Toxaphene	250	U
11104-28-2	Aroclor-1221	100	U
11141-28-2	Aroclor-1232	100	U
53469-21-9/12674-11-2	Aroclor-1242/1016	68	U
12672-29-6	Aroclor-1248	100	U
11097-57-4	Aroclor-1254		SD
11096-82-5	Aroclor-1260		SD

U: Concentration of analyte is less than the value given.
SD: See dilution
X: Elevated detection limit due to PCB interference.

961349?.1294

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT3DL

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004DL

Sample wt/vol: 30.0 (g/ml) g Lab File ID: _____

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 68 dec. _____ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01-24-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 25

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
319-84-6	alpha-BHC	77	U
319-85-7	beta-BHC	150	U
319-86-8	delta-BHC	230	U
58-89-9	gamma-BHC (Lindane)	100	U
76-44-8	Heptachlor	77	U
309-00-2	Aldrin	100	U
1024-57-3	Heptachlor epoxide	2100	U
959-98-8	Endosulfan I	360	U
60-57-1	Dieldrin	52	U
72-55-9	4,4'-DDE	100	U
72-20-8	Endrin	780	UX
33213-65-9	Endosulfan II	100	U
72-54-8	4,4'-DDD	280	U
1031-07-8	Endosulfan sulfate	1700	U
50-29-3	4,4'-DDT	340	UX
72-43-5	Methoxychlor	4500	U
53494-70-5	Endrin Aldehyde	590	U
57-74-9	Tech. Chlordane	360	U
8001-35-2	Toxaphene	6200	U
11104-28-2	Aroclor-1221	2600	U
11141-28-2	Aroclor-1232	2600	U
53469-21-9/12674-11-2	Aroclor-1242/1016	1700	U
12672-29-6	Aroclor-1248	2600	U
11097-57-4	Aroclor-1254	9800	
11096-82-5	Aroclor-1260	7500	

U: Concentration of analyte is less than the value given.
X: Elevated detection limit is due to PCB interference.

9613497.1295

Quanterra
Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: ICAP Metals
Method: EPA 6010
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID: BODMT2

Quanterra ID : 7344-002

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aluminum	7429-90-5	QCBLK57519-1	01/24/95	01/25/95	53700	MG/KG		35.4	1
Antimony	7440-36-0	QCBLK57519-1	01/24/95	01/25/95	7.8	MG/KG	B	17.7	1
Barium	7440-39-3	QCBLK57519-1	01/24/95	01/25/95	74.3	MG/KG		35.4	1
Beryllium	7440-41-7	QCBLK57519-1	01/24/95	01/25/95	0.59	MG/KG	B	1.2	1
Cadmium	7440-43-9	QCBLK57519-1	01/24/95	01/25/95	2.6	MG/KG	B	3.5	1
Calcium	7440-70-2	QCBLK57519-1	01/24/95	01/25/95	3630	MG/KG		885	1
Chromium	7440-47-3	QCBLK57519-1	01/24/95	01/25/95	66.4	MG/KG		3.5	1
Cobalt	7440-48-4	QCBLK57519-1	01/24/95	01/25/95	7.3	MG/KG		8.9	1
Copper	7440-50-8	QCBLK57519-1	01/24/95	01/25/95	68.6	MG/KG		4.4	1
Iron	7439-89-6	QCBLK57519-1	01/24/95	01/25/95	20100	MG/KG		17.7	1
Lead	7439-92-1	QCBLK57519-1	01/24/95	01/25/95	104	MG/KG		17.7	1
Magnesium	7439-95-4	QCBLK57519-1	01/24/95	01/25/95	3090	MG/KG		885	1
Manganese	7439-96-5	QCBLK57519-1	01/24/95	01/25/95	140	MG/KG		2.7	1
Nickel	7440-02-0	QCBLK57519-1	01/24/95	01/25/95	14.7	MG/KG		7.1	1
Potassium	7440-09-7	QCBLK57519-1	01/24/95	01/25/95	654	MG/KG	B	885	1
Silver	7440-22-4	QCBLK57519-1	01/24/95	01/25/95	0.76	MG/KG	B	35.4	1
Sodium	7440-23-5	QCBLK57519-1	01/24/95	01/25/95	244	MG/KG		177	1
Vanadium	7440-62-2	QCBLK57519-1	01/24/95	01/25/95	45.0	MG/KG		8.9	1
Zinc	7440-66-6	QCBLK57519-1	01/24/95	01/25/95	450	MG/KG		3.5	1

0094

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra Environmental Services

Project: 550.56

Category: ICAP Metals
Method: EPA 6010
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID: B0DMT3

Quanterra ID : 7344-004

Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dilution
Aluminum	7429-90-5	QCBLK57519-1	01/24/95	01/25/95	63400	MG/KG		62.0	1
Antimony	7440-36-0	QCBLK57519-1	01/24/95	01/25/95	10.1	MG/KG	U	31.0	1
Barium	7440-39-3	QCBLK57519-1	01/24/95	01/25/95	107	MG/KG		62.0	1
Beryllium	7440-41-7	QCBLK57519-1	01/24/95	01/25/95	0.76	MG/KG	B	2.2	1
Cadmium	7440-43-9	QCBLK57519-1	01/24/95	01/25/95	4.7	MG/KG	B	6.2	1
Calcium	7440-70-2	QCBLK57519-1	01/24/95	01/25/95	4200	MG/KG		1550	1
Chromium	7440-47-3	QCBLK57519-1	01/24/95	01/25/95	77.1	MG/KG		6.2	1
Cobalt	7440-48-4	QCBLK57519-1	01/24/95	01/25/95	9.4	MG/KG		15	1
Copper	7440-50-8	QCBLK57519-1	01/24/95	01/25/95	55.8	MG/KG		7.7	1
Iron	7439-89-6	QCBLK57519-1	01/24/95	01/25/95	21000	MG/KG		31.0	1
Lead	7439-92-1	QCBLK57519-1	01/24/95	01/25/95	197	MG/KG		31.0	1
Magnesium	7439-95-4	QCBLK57519-1	01/24/95	01/25/95	4180	MG/KG		1550	1
Manganese	7439-96-5	QCBLK57519-1	01/24/95	01/25/95	201	MG/KG		4.6	1
Nickel	7440-02-0	QCBLK57519-1	01/24/95	01/25/95	18.8	MG/KG		12	1
Potassium	7440-09-7	QCBLK57519-1	01/24/95	01/25/95	970	MG/KG	B	1550	1
Silver	7440-22-4	QCBLK57519-1	01/24/95	01/25/95	1.3	MG/KG	B	62.0	1
Sodium	7440-23-5	QCBLK57519-1	01/24/95	01/25/95	286	MG/KG	B	310	1
Vanadium	7440-62-2	QCBLK57519-1	01/24/95	01/25/95	46.5	MG/KG		15	1
Zinc	7440-66-6	QCBLK57519-1	01/24/95	01/25/95	1030	MG/KG		6.2	1

9613497.1297

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Arsenic
Method: EPA 7060
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/08/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Arsenic	7440-38-2	QCBLK57520-1	01/24/95	01/25/95	0.12	MG/KG	U	1.0	1
BODMT6	7344-001MS	Arsenic	7440-38-2	QCBLK57520-1	01/24/95	01/25/95	105	%REC			1
BODMT6	7344-001MSD	Arsenic	7440-38-2	QCBLK57520-1	01/24/95	01/25/95	104	%REC			1
BODMT2	7344-002	Arsenic	7440-38-2	QCBLK57520-1	01/24/95	01/25/95	14.4	MG/KG		17.7	10
BODMT3	7344-004	Arsenic	7440-38-2	QCBLK57520-1	01/24/95	01/25/95	41.1	MG/KG		31.0	10
NA	QCBLK57520-1	Arsenic	7440-38-2	QCBLK57520-1	01/24/95	01/25/95	0.12	MG/KG	U	1.0	1
NA	QCLCS57520-1	Arsenic	7440-38-2	QCBLK57520-1	01/24/95	01/25/95	126	%REC			20

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Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Selenium
Method: EPA 7740
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/08/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Selenium	7782-49-2	QCBLK57520-1	01/24/95	01/25/95	0.10	MG/KG	U	0.50	1
BODMT6	7344-001MS	Selenium	7782-49-2	QCBLK57520-1	01/24/95	01/25/95	106	%REC			1
BODMT6	7344-001MSD	Selenium	7782-49-2	QCBLK57520-1	01/24/95	01/25/95	97	%REC			1
BODMT2	7344-002	Selenium	7782-49-2	QCBLK57520-1	01/24/95	01/25/95	0.18	MG/KG	U	0.89	1
BODMT3	7344-004	Selenium	7782-49-2	QCBLK57520-1	01/24/95	01/25/95	0.31	MG/KG	U	1.5	1
NA	QCBLK57520-1	Selenium	7782-49-2	QCBLK57520-1	01/24/95	01/25/95	0.10	MG/KG	U	0.50	1
NA	QCLCS57520-1	Selenium	7782-49-2	QCBLK57520-1	01/24/95	01/25/95	112	%REC			20

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Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Thallium
Method: EPA 7841
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/08/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Thallium	7440-28-0	QCBLK57520-1	01/24/95	01/25/95	0.10	MG/KG	B	1.0	1
BODMT6	7344-001MS	Thallium	7440-28-0	QCBLK57520-1	01/24/95	01/25/95	91	%REC			1
BODMT6	7344-001MSD	Thallium	7440-28-0	QCBLK57520-1	01/24/95	01/25/95	89	%REC			1
BODMT2	7344-002	Thallium	7440-28-0	QCBLK57520-1	01/24/95	01/25/95	0.28	MG/KG	B	1.8	1
BODMT3	7344-004	Thallium	7440-28-0	QCBLK57520-1	01/24/95	01/25/95	0.32	MG/KG	B	3.1	1
NA	QCBLK57520-1	Thallium	7440-28-0	QCBLK57520-1	01/24/95	01/25/95	0.090	MG/KG	U	1.0	1
NA	QCLCS57520-1	Thallium	7440-28-0	QCBLK57520-1	01/24/95	01/25/95	100	%REC			20

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U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0DMT2

Lab Name: ITAS_ST._LOUIS Contract: 550.56

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0429

Matrix (soil/water): SOIL Lab Sample ID: 7344-002

Level (low/med): LOW Date Received: 01/18/95

% Solids: 56.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	53700			P
7440-36-0	Antimony	7.8	B		P
7440-38-2	Arsenic	14.4	B		F
7440-39-3	Barium	74.3			P
7440-41-7	Beryllium	0.59	B		P
7440-43-9	Cadmium	2.6	B		P
7440-70-2	Calcium	3630			P
7440-47-3	Chromium	66.4			P
7440-48-4	Cobalt	7.3	B		P
7440-50-8	Copper	68.6			P
7439-89-6	Iron	20100			P
7439-92-1	Lead	104			P
7439-95-4	Magnesium	3090			P
7439-96-5	Manganese	140			P
7440-02-0	Nickel	14.7			P
7440-09-7	Potassium	654	B		P
7782-49-2	Selenium	0.18	U		F
7440-22-4	Silver	0.76	B		P
7440-23-5	Sodium	244			P
7440-28-0	Thallium	0.28	B		F
7440-62-2	Vanadium	45.0			P
7440-66-6	Zinc	450			P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

SW-846

00954

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0DMT3

Lab Name: ITAS_ST._LOUIS_____ Contract: 550.56____
Lab Code: ITMO__ Case No.:_____ SAS No.:_____ SDG No.: W0429_____
Matrix (soil/water): SOIL_ Lab Sample ID: 7344-004
Level (low/med): LOW__ Date Received: 01/18/95
% Solids: _32.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	63400			P
7440-36-0	Antimony	10.1	U		P
7440-38-2	Arsenic	41.1			F
7440-39-3	Barium	107			P
7440-41-7	Beryllium	0.76	B		P
7440-43-9	Cadmium	4.7	B		P
7440-70-2	Calcium	4200			P
7440-47-3	Chromium	77.1			P
7440-48-4	Cobalt	9.4	B		P
7440-50-8	Copper	55.8			P
7439-89-6	Iron	21000			P
7439-92-1	Lead	197			P
7439-95-4	Magnesium	4180			P
7439-96-5	Manganese	201			P
7440-02-0	Nickel	18.8			P
7440-09-7	Potassium	970	B		P
7782-49-2	Selenium	0.31	U		F
7440-22-4	Silver	1.3	B		P
7440-23-5	Sodium	286	B		P
7440-28-0	Thallium	0.32	B		F
7440-62-2	Vanadium	46.5			P
7440-66-6	Zinc	1030			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

_____

_____

_____

_____

9613497.1302

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Chloride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.96	UG/G		2.47	1
BODMT6	7344-001DUP	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.96	UG/G		2.46	1
BODMT6	7344-001MS	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	102	%REC			5
BODMT2	7344-002	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	15.4	UG/G		4.25	1
BODMT3	7344-004	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	20.3	UG/G		7.66	1
NA	QCBLK57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.50	UG/G	U	2.50	1
NA	QCLCS57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	94	%REC			1

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Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Fluoride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0DMT6	7344-001	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	0.99	UG/G	U	0.99	1
B0DMT6	7344-001DUP	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	0.98	UG/G	U	0.98	1
B0DMT6	7344-001MS	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	107	%REC			1
B0DMT2	7344-002	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	1.70	UG/G	U	1.70	1
B0DMT3	7344-004	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	6.25	UG/G		3.06	1
NA	QCBLK57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	1.00	UG/G	U	1.00	1
NA	QCLCS57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	103	%REC			1

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra Environmental Services

Project: 550.56

Category: Nitrate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001DUP	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001MS	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	106	%REC			1
BODMT2	7344-002	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	69.5	UG/G		1.70	5
BODMT3	7344-004	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	50.3	UG/G		1.22	2
NA	QCBLK57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
NA	QCLCS57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	100	%REC			1

Quanterra Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Nitrite
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil
B0DMT6	7344-001	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
B0DMT6	7344-001DUP	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
B0DMT6	7344-001MS	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	103	%REC			5
B0DMT2	7344-002	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.34	UG/G	U	0.34	1
B0DMT3	7344-004	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.61	UG/G	U	0.61	1
NA	QCBLK57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
NA	QCLCS57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	104	%REC			1

01114

Quanterra Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Orthophosphate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.86	UG/G	U	9.86	1
BODMT6	7344-001DUP	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.84	UG/G	U	9.84	1
BODMT6	7344-001MS	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	102	%REC			1
BODMT2	7344-002	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	17.0	UG/G	U	17.0	1
BODMT3	7344-004	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	30.6	UG/G	U	30.6	1
NA	QCBLK57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	10.0	UG/G	U	10.0	1
NA	QCLCS57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	96	%REC			1

01115

9615497.1307

Quanterra
Environmental
Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Sulfate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	9.86	UG/G	U	9.86	1
BODMT6	7344-001DUP	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	9.84	UG/G	U	9.84	1
BODMT6	7344-001MS	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	101	%REC			5
BODMT2	7344-002	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	2230	UG/G		170	10
BODMT3	7344-004	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	4040	UG/G		306	10
NA	QCBLK57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	10.0	UG/G	U	10.0	1
NA	QCLCS57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	97	%REC			1

01116

Project #: 262.01, 550.50, 578.02, 550.56
Analyst: J. Flandreau
Reviewed By: JM Ryan, jr/02-03-95
Reviewed By:
Page 1 of 2

QUANTERRA ST. LOUIS

ANIONS BY I.C.

ug/g ug/L (mg/L) (circle one)

Prep Date: 01-20-95
Analysis Date: 01-20-95
Loop Used: 50ul
Batch #: 57444
Method #: 300.0

	Standard Value	Sample ID	Standard ID	Solid Fract.	Dil.	Fl	Cl	SO_4	NO_3-N	OPO_4	NO_2-N	Br
1		QCBLK57444			1	<0.100	<0.250	<1.00	<0.020	<1.00	<0.020	—
2	Fl 1 NO3 .750 Cl 1 NO2 .080 SO4 4 OP 4	QCLCS57444	AL0459-95		1	0.974	0.925	3.84	0.197	3.80	0.081	—
3		7339-001			Fl 1 SO4 5 Cl 5	0.372	15.8	27.3	—	—	—	—
4		dup 001			↓	0.357	15.4	27.3	—	—	—	—
5	Fl 2 SO4 20 Cl 20	MS 001	AL0460-95		Fl 1 SO4 5 Cl 10	2.30	35.1	48.3	—	—	—	—
6		003			Fl 1 SO4 1 Cl 1	<0.100	<0.250	<1.00	—	—	—	—
7		↓ 004			Fl 1 SO4 1 Cl 1	<0.100	<0.250	<1.00	—	—	—	—
8		7343-001			Fl 1 NO3 1 Cl 2 NO2 1 SO4 2 OP 1	0.206	8.18	22.6	<0.020	<1.00	<0.020	—
9		002			Fl 1 NO3 1 Cl 1 NO2 1 SO4 1 OP 1	<0.100	<0.250	<1.00	<0.020	<1.00	<0.020	—
10		↓ 003			Fl 1 NO3 1 Cl 1 NO2 1 SO4 1 OP 1	<0.100	<0.250	<1.00	<0.020	<1.00	<0.020	—
11		7338-003			Fl 5 SO4 25 Cl 50	6.78	161	437	—	—	—	—
12		004			Cl 20 SO4 2	—	50.9	35.5	—	—	—	—
13		005			Cl 50 SO4 5	—	140	64.1	—	—	—	—
14		006			Cl 5 SO4 20	—	8.09	291	—	—	—	—
15		↓ 007			Cl 5 SO4 20	—	7.05	349	—	—	—	—
16		QCBLK57444			1	<1.00 ug/g	<2.50 ug/g	<10.0 ug/g	<0.200 ug/g	<10.0 ug/g	<0.200 ug/g	—

0117

% Recovery

	Fl	Cl	SO_4	NO_3-N	OPO_4	NO_2-N	Br
LCS-1 H2O	97	92	96	98	95	101	—
LCS-2 SOIL	103	94	97	100	96	104	—
7339 MS	96	96	105	—	—	—	—
7340 MS	107	102	101	106	102	103	—
jmr 02-03-95 MS	—	—	—	—	—	—	—
_____	—	—	—	—	—	—	—

RPD

	Fl	Cl	SO_4	NO_3-N	OPO_4	NO_2-N	Br
7339 DUP	4	3	<1	—	—	—	—
7344 DUP	*	<1	*	*	*	*	—
_____ DUP	—	—	—	—	—	—	—

* can't calculate

QUANTERRA ST. LOUIS

ANIONS BY I.C.

(ug/g) ug/L mg/L (circle one)

Project #: 262.01, 550.50, 578.02, 550.56
Analyst: J. Flandreau
Reviewed By: [signature] 02-03-95
Reviewed By:
Page 2 of 2

Prep Date: 01-20-95
Analysis Date: 01-20-95
Loop Used: 50 ml
Batch #: 57444
Method #: 300.0

	Standard Value	Sample ID	Standard ID	Solid Fract.	Dil.	Fl	Cl	SO_4	NO_3-N	OPO_4	NO_2-N	Br
17	Fl 10 NO3 2.00 Cl 10 NO2 2.00 SO4 40 OP 40	QCLCS57444	AL 0461-95		1	10.3	9.36	38.8	2.00	38.5	0.830	—
18		7344-001		0.9997	1	<0.986	2.96	<9.86	<0.197	<9.86	<0.197	—
19		DUP 001		↓	1	<0.984	2.96	<9.84	<0.197	~~<9.84~~ <9.83	<0.197	—
20	Fl 19.0 NO3 4.39 Cl 190 NO2 5.19 SO4 190 OP 19.0	MS 001	AL 0462-95	↓	Fl 1 Cl 1/5 SO4 1/5 NO3 1/5 NO2 1/5 OP 1	20.3	196	191	4.56	19.3	5.98	—
4		002		0.5649	Fl 1 Cl 1 SO4 1/10 NO3 1/5 NO2 1/5 OP 1	<1.70	15.4	2230	69.5	<17.0	<0.340	—
22		003		0.4787	Fl 1 Cl 1 SO4 1/10 NO3 1/5 NO2 1/5 OP 1	<2.07	16.9	2130	78.4	<20.7	<0.415	—
23		004		0.3228	Fl 1 Cl 1 SO4 1/10 NO3 1/2 NO2 1/2 OP 1	6.25	20.3	4040	50.3	<30.6	<0.612	—
24		005		0.3004	Fl 1 Cl 1 SO4 1/10 NO3 1/2 NO2 1/2 OP 1	6.45	21.5	4390	40.2	<32.8	<0.655	—
25		006		0.3010	Fl 1 Cl 1 SO4 1/5 NO3 1 NO2 1 OP 1	<3.26	17.6	2100	<0.653	<32.6	<0.653	—
26		007		0.7019	Fl 1/5 Cl 1/5 SO4 1/5 NO3 1/2 NO2 1/2 OP 1	<1.39	81.7	774	20.0	<13.9	<0.277	—

J. Flandreau 2-24-95

8111 8

9613497.1310

Quanterra Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: NO2-NO3
Method: EPA 353.1
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.48	UG/G	U	0.48	1
BODMT6	7344-001DUP	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	U	0.50	1
BODMT6	7344-001MS	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	104	%REC			1
BODMT2	7344-002	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	53.4	UG/G		4.40	5
BODMT3	7344-004	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	35.4	UG/G		3.09	2
NA	QCBLK57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	U	0.50	1
NA	QCLCS57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	92	%REC			1

01174

ITAS-ST. LOUIS

NITRATE/NITRITE-N REPORT

Pg. 1 of 2

Analyst: S. Poppe
Project No.: 550.56 522.05
Reviewed by: R. Patterson

Batch No.: 57497

prep. Analysis Date: 01-24-95
Method No.: 353.1
Date: 02-09-95

LAB ID	STANDARD ID	RAW VALUE x	DILUTION ÷	SAMPLE VOLUME (L or g) =	NITRATE/ NITRITE x	EXTRACT VOLUME (L) ÷	FRACTION SOLID =	FINAL CONCENTRATION (ug/L)-N (ug/g)-N	% RECOVERY	RPD
BLANK 57497-1		-3.764		5.000		0.05		<0.5		
LCS 57497-1	AW056645	529.2		5.000				5.29	94	
7342-014		72.19		5.006			0.2443	2.95		
015		302.6		5.103			0.2336	12.7		
016		1.909		5.028			0.7973	<0.624		
7357-001		42.25		5.162			0.2180	<2.22		
002		32.80		5.072			0.6437	<0.766		
003		36.58		5.041			0.1624	<3.05		
003DP		36.58		5.153				<2.99		*
003MS	AW056795	489.1		5.091				29.6	87	
004		17.04		5.160			0.6509	<0.744		
005		28.38		5.369			0.1122	<4.15		
006		26.49		5.271			0.6941	<0.683		
007		28.70		5.312			0.2305	<2.04		
008		17.67		5.093			0.6325	<0.776		
009		23.97		5.065			0.2369	<2.08		
010		11.99		5.030			0.4870	<1.02		
011		22.08		5.041			0.2445	<2.03		
012		11.99		5.030			0.7301	<0.681		
013		29.01		5.125			0.3907	<1.25		

* CAN'T CALCULATE RPD DUE TO VALUES < DETECTION LIMIT
All sample results were corrected for solid fraction.

SL-91-INORG-0039

01175

ITAS-ST. LOUIS

NITRATE/NITRITE-N REPORT

Analyst: S. POPPE
Project No.: 550.56 S22205
Reviewed by: R. Patterson

Batch No.: S7497

Analysis Date: 01.24.95
Method No.: 353.1
Date: 02-09-95

LAB ID	STANDARD ID	RAW VALUE x	DILUTION +	SAMPLE VOLUME (L or g) =	NITRATE/ NITRITE x	EXTRACT VOLUME (L) +	FRACTION SOLID =	FINAL CONCENTRATION (ug/L)-N (ug/g)-N	% RECOVERY	RPD
7357-014		7.582		5.133		0.05	0.3429	<1.42		
015		-6.285		5.087			0.4969	<0.989		
016		17.04		5.030			0.7965	<0.624		
017		15.78		5.052			0.7174	<0.690		
QCBKS7497-2		-13.53		5.000				<0.5		
QCLCS7497-2	AW568-95	519.1		5.000				5.19	92	
7344-00		34.69		5.174			0.9997	<0.483		
001DP		31.22		5.036			~~0.9997~~	<0.497		*
001MS	AW569-95	590.0		5.036				5.86	104	
002		607.2	5	5.028			0.5649	53.4	~~104~~ RPD 02-08-95	
003		588.5	5	5.054			0.4787	60.8		
004		573.3	2	5.019			0.3228	35.4		
005		588.1		5.067			0.3004	19.3		
006		27.75		5.222			0.3010	<1.59		

* CAN'T CALCULATE RPD DUE TO VALUES < DETECTION LIMIT
All sample results were corrected for solid fraction.

9613497.1313

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra Environmental Services

Project: 550.56

Category: Sulfide
Method: EPA 9030
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.8	UG/G		10.6	1
BODMT6	7344-001DUP	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.6	UG/G	U	10.6	1
BODMT6	7344-001MS	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	78	%REC			1
BODMT2	7344-002	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	21.0	UG/G		19.0	1
BODMT3	7344-004	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	44.7	UG/G		34.0	1
NA	QCBLK57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.6	UG/G	U	10.6	1
NA	QCLCS57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	84	%REC			1

01211

ITAS - ST LOUIS
SULFIDES
(SOIL)

PREP DATE: 01-23-95
ANALYSIS DATE: 01-23-95
ANALYST: K. Harvey
BATCH NO.: 57691

REVIEWED BY: R. Patterson/02-21-9
REVIEWED BY: R. Patterson/02-21-9
PROJECT NO.: 550.56
METHOD NO.: 9030

LAB I.D.	SAMPLE VOLUME ml or (gram)	ACTUAL VOLUME TITRATED	SOLID FRACTION	IODINE ml of Iodine	BURET READING ml of $Na_2S_2O_3$ final	initial	net	SULFIDE CONC. mg/L (µg/g)
QCBLK57691-1	20.15g/200ml	188	N/A	10	10.00	0	10.00	<10.6 ✓
IP0037-95 QCLCS57691-1	20.09g/	↓	↓	↓	6.00	↓	6.00	83.9 ✓
7344-001	20.16g/		0.9997 ✓		9.45		9.45	10.8 ✓
001DUP	20.03g/		0.9997		9.60		9.60	<10.6 ✓
IP0039-95 001MS	20.04g/	↓	0.9997		5.80		5.80	88.4 ✓
002	20.24g/	186	0.5649 ✓		9.40		9.40	21.0 ✓
003	20.26g/	184	0.4787 ✓		9.50		9.50	<22.4 ~~20.6~~ ✓ RP 02-21-9
004	20.12g/	182	0.3228 ✓		9.30		9.30	44.7 ✓
005	20.32g/	184	0.3004 ✓		9.40		9.40	39.9 ~~40.0~~ ✓ RP 02-21-95
006	20.25g/		0.3010 ✓		9.45		9.45	36.4 ✓
007	20.18g/ ↓	↓	0.7019 ✓	↓	9.50	↓	9.50	<15.3 ~~14.1~~ ✓ RP 02-21-9

K. Harvey 01-25-95

sample results were corrected for solid fraction.

Iodine Normality 0.0249 N

$Na_2S_2O_3$ Normality 0.0250

$$\text{SULFIDE mg/L or (µg/g)} = \frac{[(\text{mL Iodine} \times \text{N Iodine}) - (\text{mL } Na_2S_2O_3 \times \text{N } Na_2S_2O_3)] \times 16{,}000}{(\text{ml or (gram) of SAMPLE titrated})(\text{SOLID Fraction})}$$

LCS True Value = 99.4 ug/g ✓
Percent Recovery = 84% ✓
Dup RPD = Can't be calculated

MS True Value = 100 ug/g ✓
Percent Recovery = ~~88%~~ 78% ✓
ANH 01-25-95

SL-91-INORG 0028

9613497.1315

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra Environmental Services

Project: 550.56

Category: TOX
Method: EPA 9020
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	47.1	UG/G	U	47.1	1
BODMT6	7344-001DUP	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	46.1	UG/G	U	46.1	1
BODMT6	7344-001MS	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	101	%REC			1
BODMT2	7344-002	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	86.8	UG/G	U	86.8	1
BODMT3	7344-004	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	150	UG/G	U	150	1
NA	QCBLK58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	50.0	UG/G	U	50.0	1
NA	QCLCS58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	99	%REC			1

01221

QUANTERRA, INC.

EOX ANALYSIS

1 of 3

ANALYSIS DATE: 020695
ANALYST: J. CARO
BATCH #: 58657

APPROVED: R. Patterson/02-22-95
METHOD: 9020
PROJECT #: 550.56

SAMPLE ID	STANDARD CONCENTRATION	SAMPLE VOL,G A	VOLUME ETHYL ACETATE ~~+REAGENT WATER~~, ML B	VOLUME INJECTED, UL C	INSTRUMENT PRINTOUT D	RECOVERY FACTOR E	EOX CONC ~~DILUTION~~ F	FRACTION SOLID G	Avg EOX FINAL CONC UG/G CL
QCBLK58657-1		1.000	5.0	50	0.01	1.0	<50		
↓	100 ug/g				0.01		<50		<50
QCLCS58657-1	A0499-95	1.000			1.00		100		
↓					0.98		98		99.0 99%
7344-001		1.061			0.13		<47.1	0.9997	
↓					0.12		<47.1		<47.1
7344-001DP		1.086			0.13		<46.1		
↓					0.11		<46.1		<46.1 RPD
7344-001MS	100 ug/g A0500-95	1.039			1.08		104		
↓					1.02		98.2	↓	101 101%
7344-002		1.020			0.14		<86.8	0.5649	
↓					0.13		<86.8	↓	<86.8
7344-003		1.082			0.08		<96.5	0.4787	
↓					0.09		<96.5	↓	<96.5
7344-004		1.030			0.13		<150	0.3228	
↓					0.14		<150	↓	<150
7344-005		1.080			0.09		<154	0.3004	
↓					0.09		<154	↓	<154
7344-006		1.089			0.14		<153	0.3010	
↓	RPD 02-22-95		↓	↓	0.13	↓	<153	↓	<153

01222

CALCULATION: $\frac{B \times D \times F}{A \times C \times E \times G} \times 1000 = UG/G\ CL$

* CAN'T CALCULATE RPD DUE TO LACK OF DETECTION LIMITS

QUANTERRA, INC.

EOX ANALYSIS

ANALYSIS DATE: 02/05/95
ANALYST: J. ARRO
BATCH #: 58657

2 of 3

APPROVED: R. Patterson/02-22-95
METHOD: 9023
PROJECT #: 550.56

SAMPLE ID	STANDARD CONCENTRATION	SAMPLE VOL,G A	VOLUME ETHYL ACETATE ~~+ REAGENT WATER~~, ML B	VOLUME INJECTED, UL C	INSTRUMENT PRINTOUT D	RECOVERY FACTOR E	EOX CONC ~~DILUTION~~ F	FRACTION SOLID G	AVG EOX FINAL CONC UG/G CL
7444-001		1.090	5.0	50	0.08	1.0	<47.7	0.9616	
↓					0.09		<47.7		<47.7
7444-001DUP		1.080			0.10		<48.1		
↓					0.09		<48.1		<48.1 *
7444-001MS	104 UG/G ACO501-95	1.071			1.02		99.0		95%
↓					1.01		98.1	↓	98.6
7444-002		1.028			0.06		<56.7	0.8574	EP 02-22-95
↓					0.07		<56.7	↓	<56.7
7444-003		1.028			0.07		<298	0.1630	
↓					0.05		<298	↓	<298
7444-004		1.044			0.05		<52.5	0.9128	
↓					0.03		<52.5	↓	<52.5
7444-005		1.013			0.05		<111	0.4446	
↓					0.04		<111	↓	<111
7444-006		1.014			0.10		<52.2	0.9445	
↓					0.09		<52.2	↓	<52.2
7444-007		1.000			0.06		<56.9	0.8792	
↓					0.07		<56.9	↓	<56.9
7444-008		1.085			0.10		<49.3	0.9354	
↓	RPD 02-22-95				0.09		<49.3	↓	<49.3

01223

CALCULATION: $\frac{B \times D \times F}{A \times C \times E \times G} \times 1000 = UG/G\ CL$

* CAN'T CALCULATE RPD DUE TO VALUES < DETECTION LIMITS

SL-91-INORG-004

QUANTERRA, INC.

EOX ANALYSIS

3 of 3

ANALYSIS DATE: 02-06-95
ANALYST: J. CARRIO
BATCH #: 58657

APPROVED: R. Patterson/02-22-95
METHOD: 9020
PROJECT #: 550.56

SAMPLE ID	STANDARD CONCENTRATION	SAMPLE VOL,G A	VOLUME ETHYL ACETATE ~~+ REAGENT WATER~~, ML B	VOLUME INJECTED, UL C	INSTRUMENT PRINTOUT D	RECOVERY FACTOR E	~~EOX~~ CONC ~~DILUTION~~ F	FRACTION SOLID G	AVG EOX FINAL CONC UG/G CL
7444-009		1.077	5.0	50	0.07	1.0	<49.9	0.930	
↓			↓	↓	0.06	↓	<49.9	↓	<49.9
7444010		1.000			0.07		<105	0.4744	
↓					0.06		<105	↓	<105
7444011		1.079			0.02		<46.4	0.9991	
↓					0.01		<46.4	↓	<46.4
7444012		1.083			0.06		<49.7	0.9285	
↓			↓	↓	0.07	↓	<49.7	↓	<49.7
								~~0.4893~~	
								0.4880	
								0.4077	
								0	
	RP 02-22-95								

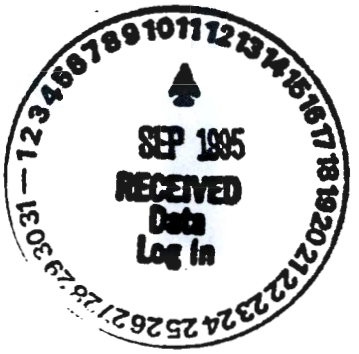
Jan-24-96

CALCULATION: $\frac{B \times D \times F}{A \times C \times E \times G} \times 1000 = UG/G\ CL$

01224

SL-91-INORG-004

Quanterra
Environmental Services



September 8, 1995

Ms. Doris Ayres
Bechtel Hanford Incorporated
345 Hills Street
Richland, WA 99352

Dear Doris:

This letter is sent to inform you of a change in analytical report sheets. Attached are radiochemical results for three SDGs (W0386, W0403 and W0429). Please remove and replace the appropriate pages. Please note for sample number B0DMT1 the sample had to be recounted in order to obtain the U-235 result.

If you have any questions I can be reached at 375-3131.

Sincerely,

Jodie Carnes
Document Control Officer

i 6/20/96 M.H.

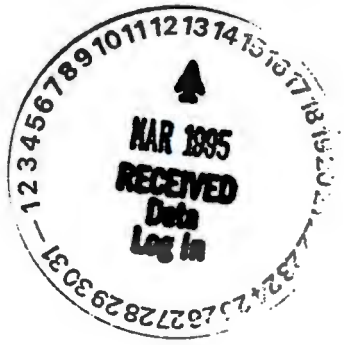
9613497.1320

Quanterra
Environmental
Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

March 13, 1995



Joan Kessner
Buyer's Technical Representative
Bechtel Hanford
P.O. Box 1970
2355 Stevens Drive
Richland, WA 99352

Reference: Contract MPV-SVV-239000.

Dear Ms. Kessner:

Accompanying this letter are the Data Package Deliverables for the Radiochemical analyses on the following BHI samples:

SDG NUMBER	SAF NUMBER
W0383	B94-155
W0384	B94-023
W0386	B94-098
W0387	B94-125
W0388	B94-003
W0395	B95-017
W0401	B94-022
W0429	B94-098

The Radiochemical Diskette Deliverable was sent via modem on the WHC BBS earlier today.

If you have any questions regarding this data package or require any additional information please contact me at 375-3131.

Sincerely,

Jodie Carnes
Document Control Officer

Receipt of this letter and the package are acknowledged by:

Name _____ Date March 13, 1995 Time 4:00pm

XC: Vicki Parr
Van Pettey
File

ii 6/20/96 M.H.

Quanterra
Environmental
Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

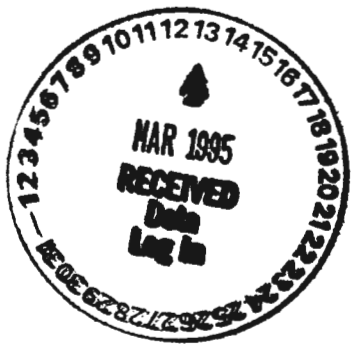
509 375-3131 Telephone
509 375-5590 Fax

Analytical Data Package Prepared For

Westinghouse/Bechtel Hanford

Radiochemical Analysis By

Quanterra Environmental Services
Richland Laboratory



Sample Delivery Group Number: W0429

CLIENT ID NUMBER	QUANTERRA ID NUMBER
B0DMT2	50132303
B0DMT3	50132305

Quanterra Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

March 13, 1995

Attention: Joan Kessner

SAF Number	:	B94-098
Date SDG Closed	:	January 26, 1995
Number of Samples	:	Two (2) - See ROD-B95-013
Sample Type	:	Soil
SDG Number	:	W0429
Data Deliverable	:	Stand Alone

I. Introduction

On January 18, 1995, seven water samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. After receipt, per ROD-B95-013, the samples were split into two separate SDGs for reporting purposes. The samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QTESRL ID	BHI ID	Matrix	Date of Receipt
50132303	B0DMT2	Soil	1/18/95
50132305	B0DMT3	Soil	1/18/95

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

Quanterra
Environmental Services

The requested analyses were:

Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222

III. Quality Control

The analytical results for each analysis performed under SDG W0429 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results with the exception of gross alpha and gross beta QC sample results which are reported in pCi/sample.

IV. Comments

BHI Off-site Property Control form W95-0-0204-3 identifies the samples as groundwater. The COC identifies the samples as soil.

Samples submitted as a single SDG, SDG W0386 (stand alone), were split into two SDGs after analysis had been started, W0386 (summary) and W0429 (stand alone), as per ROD-B95-013. The results are reported in two data packages, but were analyzed as a single batch with one set of QC.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
The Fe-59 and Eu-154 RDLs were not met for sample B0DMT2. The Co-58, Fe-59, Eu-154, and Eu-155 RDLs was not met for sample B0DMT3. The blank met the RDL requirements, therefore, the batch data are accepted. The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.

Quanterra
Environmental Services

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The batch was analyzed with two LCS samples. The soil lab is undergoing an investigation into the cause of a low spike bias for water spikes prepared in that area, and is preparing duplicate spikes for soil batches. LCS M013232S, which contains an iron carrier, is not used for reporting purposes. The LCS samples were recounted due to unacceptable recoveries and the recount result is accepted for M013231S. The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Suzanne Gaines

Suzanne Gaines
Project Manager

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	**SDG:**	W0429
LAB SAMPLE ID:	50132303	**MATRIX:**	SOIL
CLIENT ID:	B0DMT2	**DATE RECEIVED:**	1/18/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
U-235	2.49E-01	1.1E-01	1.2E-01	N/A	pCi/g	N/A	RD3234
CO-58	1.65E-02	2.6E-02	2.6E-02	4.42E-02	pCi/g	N/A	RD3219
CO-60	9.29E-01	6.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219
CS-137DA	2.72E+00	7.0E-02	2.8E-01	N/A	pCi/g	N/A	RD3219
EU-152	1.55E+00	1.2E-01	1.9E-01	N/A	pCi/g	N/A	RD3219
EU-154	3.31E-01	6.6E-02	7.4E-02	1.36E-01	pCi/g	N/A	RD3219
EU-155	7.90E-02	5.9E-02	6.0E-02	8.92E-02	pCi/g	N/A	RD3219
FE-59	-4.54E-02	6.8E-02	6.8E-02	1.07E-01	pCi/g	N/A	RD3219
K-40	9.57E+00	5.7E-01	1.1E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	8.63E-01	4.5E-02	9.7E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	8.13E-01	7.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219
RA-228DA	7.21E-01	1.3E-01	1.5E-01	N/A	pCi/g	N/A	RD3219
U-238DLP	2.76E+00	1.2E+00	1.2E+00	N/A	pCi/g	N/A	RD3219
ALPHA	9.95E+00	4.8E+00	4.9E+00	5.93E+00	pCi/g	100.00%	RD3222
BETA	2.06E+01	3.3E+00	3.6E+00	3.58E+00	pCi/g	100.00%	RD3222

Number of Results: 15

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	**SDG:**	W0429
LAB SAMPLE ID:	50132305	**MATRIX:**	SOIL
CLIENT ID:	B0DMT3	**DATE RECEIVED:**	1/18/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
U-235	2.65E-01	1.9E-01	1.9E-01	N/A	pCi/g	N/A	RD3234
CO-58	1.43E-02	4.2E-02	4.2E-02	7.22E-02	pCi/g	N/A	RD3219
CO-60	2.43E+00	1.0E-01	2.6E-01	N/A	pCi/g	N/A	RD3219
CS-137DA	3.09E+00	1.0E-01	3.3E-01	N/A	pCi/g	N/A	RD3219
EU-152	1.96E+00	1.7E-01	2.6E-01	N/A	pCi/g	N/A	RD3219
EU-154	4.60E-01	1.0E-01	1.1E-01	2.01E-01	pCi/g	N/A	RD3219
EU-155	1.12E-01	7.6E-02	7.6E-02	1.29E-01	pCi/g	N/A	RD3219
FE-59	-6.69E-02	1.1E-01	1.1E-01	1.78E-01	pCi/g	N/A	RD3219
K-40	6.77E+00	7.3E-01	9.9E-01	N/A	pCi/g	N/A	RD3219
RA-224DA	1.05E+00	8.0E-02	1.3E-01	N/A	pCi/g	N/A	RD3219
RA-226DA	8.01E-01	1.1E-01	1.3E-01	N/A	pCi/g	N/A	RD3219
RA-228DA	1.51E+00	2.5E-01	2.9E-01	N/A	pCi/g	N/A	RD3219
U-238DLP	5.90E+00	1.8E+00	1.9E+00	N/A	pCi/g	N/A	RD3219
ALPHA	2.50E+01	7.0E+00	7.5E+00	5.34E+00	pCi/g	100.00%	RD3222
BETA	2.11E+01	3.3E+00	3.6E+00	3.66E+00	pCi/g	100.00%	RD3222

Number of Results: 15

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Quanterra

LOG #: RD-95-_____ page 1 of 2
QUAN-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): BHI 40386/489
NCM INITIATED BY (Name/Date): Joel T Kempema 2-22-95
PARAMETER(S): Gamma
SAMPLE NUMBER(S) AFFECTED: 50132302, 03, 04, 05, 06, 07
MATRIX: Soil

AREA: ☐ SHIP/REC ☒ RADIOCHEM ☐ COUNTING ☐ BIOASSAY ☐ DATA VERIF ☐ REPORTING ☐ OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1 ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2 ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3 ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ QA/QC:
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ CONFIRMATION:
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ DILUTION:
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ OTHER: (see #10)
3. ☐ Sample lost during extraction/analysis: no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☒ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☒ contract limits ☐ other (see #10)

   Due to:
   - ☒ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☒ Other (specify): #02 Fe59 Eu154 Eu155 #03 Fe59 Eu154 #04 Fe59 #05 Co58, Fe59, Eu154, Eu155 #06 Co58 Fe59 Eu154 Eu155 #07 Co58, Fe59, Eu154, Eu155
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date): _____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Suzy Gomes 3/8/95

FURTHER ACTION REQUIRED. SEE PAGE 2 OF 2

QUANTERRA CORPORATION

LOG #: RD-95-_____ page 2 of 2

CORRECTIVE ACTION

☒ ROOT CAUSE: INITIALS/DATE JTK 2-22-95

Sample background counts in regions of interest

☒ CORRECTIVE ACTION: INITIALS/DATE JTK 2-22-95

data accepted - blank matrix material MDA for all 30 types met, therefore we have met obligations of contract

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

FIRST LEVEL SUPERVISOR: Joel Thompson DATE: 2-22-95

RESPONSIBLE MANAGER: W MacKellar DATE: 3/10/95

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: C Black DATE: 3-3-95

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: C Black DATE: 3-3-95

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

9613497.1329

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Quanterra

LOG #: RD-95-_____ page 1 of 2
QUAN-Richland
LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): BHI W0386/407 409
NCM INITIATED BY (Name/Date): Joe/T Kempema 2-22-95 SCG 3/8
PARAMETER(S): Gamma
SAMPLE NUMBER(S) AFFECTED: M013231X, 1M 50132301
MATRIX: SO,T

AREA: ☐ SHIP/REC ☒ RADIOCHEM ☐ COUNTING ☐ BIOASSAY
☐ DATA VERIF ☐ REPORTING ☐ OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1. ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2. ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3. ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1. ☐ QA/QC:
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2. ☐ CONFIRMATION:
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3. ☐ DILUTION:
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4. ☐ OTHER: (see #10)
3. ☐ Sample lost during extraction/analysis: no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☒ Other (specify): Peaks marked detected not reported 1X = Cd109, Am241 K40 Ra226 DA Ra226 DA 1M = Cd109 #01 - Cd109 #601 Duplicate = Cd109, Am241 C2 Cd109, Na22
10. ☒ Comments/Explanation: #03 = Na22, Cd109, Xe131m #04 Na22, Cd109 #05 Na22, Cd109, Xe131m #06 = Na22, Cd109 #07 = Na22, Cd109, Xe131m

NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date): _____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ____ ☐ Other (explain)

PROJECT MANAGER (signature & date): Susan Deines 3/8/95

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

9613497.1330

QUANTERRA CORPORATION

LOG #: RD-95-________

CORRECTIVE ACTION

☒ **ROOT CAUSE:** INITIALS/DATE JTK 2-22-95

1X- K40 Ra224DA Ra226DA – blank matrix is ottawa sand that contains these naturally
Am241 – all samples with this listed were counted on Ger 2 which has a
low level of contamination on endcap, Cd109 - known phantom Xray interaction
with core liners, Na22 interference from Eu154 @ 1274 KEV
Xe131M – interference from U235 @ 163 KEV a minor abundance line

☒ **CORRECTIVE ACTION:** INITIALS/DATE JTK 2-22-95

Data accepted note in case narrative

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ **ACTIONS TO PREVENT RECURRENCE:** INITIALS/DATE ________

FIRST LEVEL SUPERVISOR: Joel Kempema DATE: 2-22-95

RESPONSIBLE MANAGER: W.S. MacKellar DATE: 3/10/95

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED: ________

ASSIGNED TO ________

QC COORDINATOR: C Black DATE: 3-13-95

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON: ________

NCM CLOSURE

QC COORDINATOR: C Black DATE: 3-13-95

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

9613497.1331

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Quanterra

LOG #: RD-95-_____ page 1 of 2

QUAN-Richland

LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): BHI W0386/429

NCM INITIATED BY (Name/Date): Joel T Kempema 3-1-95

PARAMETER(S): Alpha

SAMPLE NUMBER(S) AFFECTED: 501323

MATRIX: Soil

AREA: ☐ SHIP/REC ☒ RADIOCHEM ☐ COUNTING ☐ BIOASSAY ☐ DATA VERIF ☐ REPORTING ☐ OTHER:

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1 ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt
   - 2.2 ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3 ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1 ☐ *QA/QC:*
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2 ☐ *CONFIRMATION:*
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.2 ☐ *DILUTION:*
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4 ☐ *OTHER: (see #10)*
3. ☐ Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☐ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☐ contract limits ☐ other (see #10)

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☒ Other (specify): Spikes recounted due to low bias
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

1. ☐ Client notified by (name and date) _____
   - ☐ in writing ☐ by FAX
   - ☐ by phone ☐ Other (explain)
2. ☐ Client's name _____ and response:
   - ☐ process "as is" ☐ resample
   - ☐ on hold til ___ ☐ Other (explain)

PROJECT MANAGER (signature & date): Syd Gaines 3/8/95

FURTHER ACTION REQUIRED. SEE PAGE 2 OF 2

CORRECTIVE ACTION

☒ ROOT CAUSE: INITIALS/DATE JJC 3-1-95

Uncertain why IS except that the recount was flamed and reweighed. 25 contains Fe carrier added to see if it improves our spike recovery but could be shielding the alpha emissions.

☒ CORRECTIVE ACTION: INITIALS/DATE JJC 3-1-95

Recount of IS accepted

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE _____

FIRST LEVEL SUPERVISOR: Joel Kempema DATE: 3-1-95

RESPONSIBLE MANAGER: W Mark Kellar DATE: 3/10/95

QC REVIEW

☐ NONCONFORMANCE ☐ DEFICIENCY ☑ RERUN

☐ FURTHER ACTION REQUIRED: _____

ASSIGNED TO _____

QC COORDINATOR: CBlask DATE: 3/3-95

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON: _____

NCM CLOSURE

QC COORDINATOR: CBlask DATE: 3/3-95

SIGNED ORIGINAL MUST BE RETAINED IN FILE: ☐ QUALITY/OPERATIONS FILE ☒ PROJECT FILE

9613497.1333

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 3/2/95

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ~~ANALYSIS~~ RECORD

ANALYSIS Gross Alpha

NAME/DATE JRC 12-28-95

CUSTOMER BHI

SAMPLE DELIVERY GROUP WØ38

MATRIX Soil

BATCH NUMBER _____

	ITAS ID	CUSTOMER ID	COMMENTS
1)	MC132315	EQEG669	9.9952 ± .090472 DPM
2)	MC132325	EQEG664	10.009 ± .090592 DPM
3)			
4)			
5)			
6)			
7)			
8)			
9)			
10)			

JRC 12-28-95

REANALYSIS

REFERENCED QC

ITAS ID - BLANK _____

ITAS ID - SPIKE _____

CLIENT CODE _____

ACTIONS (Initial & Date)

PREP LAB RECEIVED _____

SAMPLE REMAINDER
RETURNED TO SCG ____ ☐ (CHECK ONE)
NO SAMPLE REMAINING ☐

SEPARATION LAB _____

COUNTING/MEASUREMENT _____

DATA REVIEWED _____

ANALYTICAL PREP STORED _____

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT JRC 2/28

DATA REVIEWED JRC 3-1-95

ANALYTICAL PREP STORED _____

ADDITIONAL COMMENTS:

1S = 589

2S = nothing

Flamed both spikes, new weights

0034

RC-048 12/92 REV

DATA VALIDATION SUMMARY REPORT FOR THE 100-DR-1 OPERABLE UNIT 100-D-PONDS PHASE II SAMPLING

Submitted To:

Bechtel Hanford Incorporated
P.O. Box 1970
2355 Stevens Drive
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Submitted By:

A.T. Kearney, Inc.
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In Response To:

Purchase Order VSR-B95-009
Task Order No. SAF-B94-098

Document Control Number
BHI-00405, Rev. 00

Validation Start Date: April 6, 1995
Validation Completion Date: April 21, 1995

May 4, 1995

DISCLAIMER

This report is designated as Revision 0. The report addresses the validation of the 100-DR-1 Operable Unit 100-D-Ponds Phase II sampling data. The report addresses only those samples that have been provided for data validation review.

All related quality assurance samples, including all field quality control samples, were reviewed and validated to verify that reported sample results were of sufficient quality to meet quality control objectives specified by Westinghouse-Hanford Corporation.

ACRONYMS

%D	Percent difference
AA	Atomic absorption
BFB	Bromofluorobenzene
BNA	Base/neutral and acid
CCB	Continuing calibration blank
CV	Coefficient of variation
CCV	Continuing calibration verification
CLP	Contract laboratory program
CRA	CRDL standard for AA
CRDL	Contract Required Detection Limit
CRI	CRDL standard for ICP
CRII	CRDL standard for ICP initial
CRIF	CRDL standard for ICP final
CRQL	Contract required quantitation limit
CVAA	Cold vapor atomic absorption
DBC	Dibutylchlorendate
DFTPP	Decafluorotriphenylphosphine
DQO	Data quality objectives
EPA	U.S. environmental protection agency
GC/MS	Gas chromatography/mass spectrometry
GC	Gas chromatography
GFAA	Graphite furnace atomic absorption
GPC	Gel permeation chromatography
ICB	Initial calibration blank
ICP	Inductively coupled plasma emission spectrometry
ICS	ICP interference check sample
ICV	Initial calibration verification
IDL	Instrument detection limit
LCS	Laboratory control sample
LCSS	Laboratory control sample soil
LCSW	Laboratory control sample water
MDA	Minimum detectable activity
MSA	Method of standard addition
MS/MSD	Matrix spike/matrix spike duplicate
PBW	Preparation blank water
PCB	Polychlorinated biphenyl
PEM	Performance evaluation mixture
QA	Quality assurance
QC	Quality control
RDL	Required detection limit

RF	Response factor
RIC	Reconstructed ion chromatogram
RPD	Relative percent difference
RRF	Relative response factor
RRT	Relative retention time
RSD	Relative standard deviation
RT	Retention time
SDG	Sample delivery group
SOW	Statement of work
TAL	Target analyte list
TCL	Target compound list
TIC	Tentatively identified compounds
TOC	Total organic carbon
TOX	Total organic halogen
V	Validated
VOC	Volatile organic compounds

CONTENTS

APPENDICES

1.0 INTRODUCTION

The information provided in this validation summary report includes data from the chemical analyses of samples from the 100-DR-1 Operable Unit 100-D-Ponds Phase II Sampling Investigation. All of the data from this sampling event and their related quality assurance samples were reviewed and validated to verify that the reported sample results were of sufficient quality to support decisions regarding remedial actions performed at this site.

Sample analyses included volatile organic, semi-volatile organic, pesticide/PCB, metals, general chemistry and radiochemistry. Three volatile organic samples were analyzed by Quanterra Environmental Services (QTES). The volatile organic samples were validated using Westinghouse-Hanford protocols specified in *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2. All volatile organic data were qualified based on this guidance. The table below lists the volatile organic Sample Delivery Groups (SDGs) that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	Volatile Organics
W0430	S	1	D	Volatile Organics

Three semi-volatile organic samples were analyzed by Quanterra Environmental Services (QTES). The semi-volatile organic samples were validated using Westinghouse-Hanford protocols specified in *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2. All semi-volatile organic data were qualified based on this guidance. The table below lists the semi-volatile organic SDGs that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	Semi-Volatiles
W0430	S	1	D	Semi-Volatiles

Three pesticide/PCB samples were analyzed by Quanterra Environmental Services (QTES). The pesticide/PCB samples were validated using Westinghouse-Hanford protocols specified in *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2. All pesticide/PCB data were qualified based on this guidance. The table below lists the pesticide/PCB SDGs that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	Pesticide/PCB
W0430	S	1	D	Pesticide/PCB

Three metals samples were analyzed by Quanterra Environmental Services (QTES). The metals samples were validated using Westinghouse-Hanford protocols specified in *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2. All metals data were qualified based on this guidance. The table below lists the metals SDGs that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	Metals
W0430	S	1	D	Metals

Three samples were analyzed for general chemistry parameters by QTES laboratories. General chemistry sample analyses included the following parameters:

- Fluoride
- Sulfate
- Chloride
- Sulfide
- Nitrate
- Nitrite
- Phosphate
- Nitrate/Nitrite
- TOX

The general chemistry samples were validated using the Westinghouse Hanford protocols specified in *Data Validation Procedures for Chemical Analyses,* WHC-SD-EN-SPP-002, Rev. 2. All general chemistry data were qualified based on this guidance. The table below lists the general chemistry SDGs that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	General Chem
W0430	S	1	D	General Chem

Three samples were analyzed for radiochemical parameters by QTES laboratories. Radiochemistry sample analyses included the following parameters:

- Gross alpha and gross beta determination
- Gamma spectroscopy

The radiochemical samples were validated using the Westinghouse-Hanford protocols specified in *Data Validation Procedures for Radiochemical Analyses,* WHC-SD-EN-SPP-001, Rev. 1. All radiochemical samples were qualified based on this guidance. The table below lists the radiochemistry SDGs that were validated for this sampling event.

SDG No.	Matrix	No. of Samples Analyzed	Level of Validation	Parameters
W0429	S	2	D	Radiochemistry
W0430	S	1	D	Radiochemistry

The following report is broken down into sections for volatile organic, semi-volatile organic, pesticide/PCB, metals, general chemical and radiochemical analyses. Each volatile organic section includes:

- A general validation summary which addresses precision, accuracy, represenativeness, completeness, and comparability;
- Holding times;
- GC/MS tuning and calibration;
- Blanks, including method blanks;
- Analytical accuracy including matrix spike samples, matrix spike duplicates, surrogates and internal standards performance;

- Analytical precision including matrix spike/matrix spike duplicates;
- Compound identification;
- Sample result quantitation, verification and reported detection limits; and
- System performance and overall assessment.

Each semi-volatile section includes:

- A general validation summary which addresses precision, accuracy, represenativeness, completeness, and comparability;
- Holding times;
- GC/MS tuning and calibration;
- Blanks, including method blanks;
- Analytical accuracy including matrix spike samples, matrix spike duplicates, surrogates and internal standards performance;
- Analytical precision including matrix spike/matrix spike duplicates;
- Compound identification;
- Sample result quantitation, verification and reported detection limits; and
- System performance and overall assessment.

Each pesticide/PCB section includes:

- A general validation summary which addresses precision, accuracy, represenativeness, completeness, and comparability;
- Holding times;
- GC/MS tuning and calibration;
- Blanks, including method blanks;
- Analytical accuracy including matrix spike samples, matrix spike duplicates, surrogates and internal standards performance;
- Analytical precision including matrix spike/matrix spike duplicates;
- Compound identification;
- Sample result quantitation, verification and reported detection limits; and
- System performance and overall assessment.

Each metals section includes:

- A general validation summary which addresses precision, accuracy, represenativeness, completeness, and comparability;
- Holding times;
- Calibrations;
- Blanks, including calibration, preparation and field blanks;

- Analytical accuracy including spike samples, laboratory control samples and GFAA analytical spikes;
- Analytical precision including laboratory duplicates, ICP serial dilutions, field duplicates, field splits, and GFAA duplicate injections;
- Sample result quantitation, verification and reported detection limits; and
- System performance and overall assessment.

Each general chemistry section includes:

- A general validation summary which addresses precision, accuracy, represenativeness, completeness, and comparability;
- Holding times;
- Calibrations;
- Blanks, including calibration, preparation and field blanks;
- Analytical accuracy including matrix spike samples and laboratory control samples;
- Analytical precision including laboratory duplicates, field duplicates and field splits;
- Sample result quantitation, verification and reported detection limits; and
- System performance and overall assessment.

Each radiochemistry section includes:

- A general validation summary which addresses precision, accuracy, represenativeness, completeness, and comparability;
- Holding times;
- Calibrations;
- Blanks, including laboratory, method and field blanks;
- Analytical accuracy including chemical recoveries, matrix spike samples and laboratory control samples;
- Analytical precision including laboratory duplicates, field duplicates and field splits;
- Sample result quantitation, verification and reported detection limits; and
- System performance and overall assessment.

In addition, the appendices include the data summary tables as well as the validated laboratory report forms for volatile organic, semi-volatile organic, pesticide/PCB, metals, general chemistry and radiochemistry analyses.

Data validation personnel added qualifiers to the reported data based on specified data quality objectives. 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 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. 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 (usable for decision-making purposes).

1.1 OBJECTIVES AND SCOPE

Data validation is performed in order to determine the usability of analytical results to support programmatic decisions regarding the selection of cleanup remedies and investigative approach. Data validation is the process of reviewing a body of analytical data to determine if it meets the criteria defined in the WHC validation guidelines, and to assure that the data are acceptable for their intended use. The validation process consists of:

- Verifying the data packages for completeness using validation Level A;
- Editing and correcting reported results;
- Verifying compliance with quality assurance (QA) requirements;
- Checking quality control (QC) values against the defined limits;
- Applying qualifiers to analytical results for the purpose of defining the limitations of the reviewed data; and
- Determining correctness of qualitative identifications and quantitative results.

The result of data validation is the completion of narrative reports, checklists, and summary forms. The validation will be used to determine whether the analytical data are acceptable for their intended use.

The objectives of this data validation project is to provide Bechtel Hanford Inc. with reliable environmental data regarding the 100-DR-1 Operable Unit 100-D-Ponds Phase II Sampling Investigation.

1.2 SAMPLES AND ANALYSES

SAMPLES AND ANALYSES						
Data Package No.	Sample Number	Sample Location	Sample Date	Sample Type	Level of Validation	Analyses[1]
W0429-QES	B0DMT2	Test Pit #2	01/17/95	Soil	D	1,2,3,4,5,6
W0429-QES	B0DMT3	Test Pit #2	01/17/95	Soil	D	1,2,3,4,5,6
W0430-QES	B0DMT4	Test Pit #2	01/27/95	Soil	D	1,2,3,4,5,6

[1] 1 = Volatile Organic, 2 = Semi-Volatile Organic, 3 = Pesticide/PCB, 4 = Inorganics, 5 = General Chemistry, 6 = Radiochemistry

2.0 VOLATILE ORGANIC DATA VALIDATION SUMMARY

2.1 SUMMARY

Positive blank contamination was noted for one methylene chloride result in SDG No. W0429 and for one methylene chloride result in SDG No. W0430. Positive blank results were detected in two acetone results in SDG No. W0429. All associated sample results were flagged accordingly.

With the exceptions noted above, the project-specific data quality objectives in terms of precision, accuracy, completeness, represenativeness, and comparability have been met.

2.2 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 analyzed within 14 days of the date of sample collection.

If holding times are exceeded, but not by $>2x$ 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 $>2x$ 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.

2.3 GC/MS TUNING AND CALIBRATION

Instrument calibration is performed to establish that the GC/MS instrument is capable of producing acceptable and reliable analytical data over a range of concentrations. The initial and continuing calibrations are performed according to CLP protocols and all results must meet validation requirements set by Westinghouse-Hanford (WHC 1992,b). An initial multipoint calibration is performed prior to sample analysis to establish the linear range of the GC/MS instrument. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All initial and continuing calibration results were acceptable.

2.4 BLANKS

2.4.1 Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or 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 <5X 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 <10x the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is <CRQL and is <10x (or <5x for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U". Tentatively identified compounds (TIC) present in the samples and blanks that are within +/-0.06 relative retention time units (RRT) of each other are qualified as undetected "U" if the sample concentration is <5x (or <10x for common laboratory contaminants) the highest blank concentration.

Due to the presence of positive blank results, sample numbers B0DMT2 and B0DMT3 in SDG No. W0429 were flagged "U" for acetone.

Due to the presence of positive blank results, sample number B0DMT2 in SDG No. W0429 was flagged "U" for methylene chloride.

Due to the presence of positive blank results, sample number B0DMT4 in SDG No. W0430 was flagged "U" for methylene chloride.

All other method blank results were acceptable.

2.5 ANALYTICAL ACCURACY

2.5.1 Matrix Spikes

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 five compounds and % recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results <5x 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 >5x the spike concentration require no qualification.

All matrix spike results were acceptable.

2.5.2 Surrogates

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. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Compounds with surrogate recoveries <10% are qualified as estimates "J" for detects, and "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification.

All surrogate recovery results were acceptable.

2.5.3 Internal Standards Performance

The evaluation of the internal standards criteria provide a means to assess the stability and sensitivity of the GC/MS system on every analysis. Internal standard area counts must be within the limits of -50% to +100% of the most recent standard. The retention time of the internal standard must not vary by more than +/-30 seconds of the most recent calibration. If area counts for a particular internal standard are outside the control limits or relative retention time criteria are > +/-30 seconds, all associated sample results are qualified as estimates (J for detects, UJ for non-detects). If area counts and retention times are both outside control limits, all non-detect sample results associated with that internal standard are qualified as unusable "UR".

All internal standard recovery results were acceptable.

2.6 ANALYTICAL PRECISION

2.6.1 Matrix spike/matrix spike duplicates

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 soil samples analyzed using SW-846 protocol, results must be within RPD limits of +/-35%. If RPD values are out of specification and the sample concentration is <5x the spike concentration, all associated sample results are qualified as estimated "J" for detects, "UJ" for non-detects. If RPD values are out of specification and the sample concentration is >5x the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate RPD results were acceptable.

2.6.2 Field Duplicates

Field duplicate results are compared using the same guidelines for determining the RPD between a sample and its duplicate. Data are not qualified based on field duplicates.

There were no field duplicates associated with the subject SDGs.

2.7 COMPOUND IDENTIFICATION

The identity of detected compounds are confirmed to investigate the possibility of false positives or false negatives. If a compound was incorrectly reported as undetected, the associated result is qualified as detected (no qualifier) or estimated "J". If retention time and mass spectral criteria are exceeded, all associated results are qualified as unusable and flagged "R". If it is determined that incorrect identifications were made as a result of cross-contamination or carryover between analyses, then the affected data are qualified as unusable and flagged "UR/R".

All compounds were identified correctly.

2.8 SAMPLE RESULTS QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

The objective of a review of results quantitation and CRQLs is to determine if quantitation was performed accurately, CRQLs were calculated properly and that the project-specific CRQLs were met. Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

All sample results and reported detection limits were acceptable.

2.9 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate. Positive blank contamination was noted in two acetone results and in one methylene chloride result in SDG No. W0429. Positive blank contamination was noted in one methylene chloride result in SDG No. W0430. The associated sample results were flagged accordingly. Contamination, however, was not significantly high enough to affect the usability

of the data. All other validated results are considered accurate within the standard error associated with the methods.

All data packages submitted for validation were found to be 100% complete.

3.0 SEMI-VOLATILE ORGANIC DATA VALIDATION SUMMARY

3.1 SUMMARY

Positive blank contamination was noted for all aldol condensate and butylbenzylphthalate results in both SDGs. Due to an internal standard recovery outside control limits, all results in SDG No. W0429 associated with internal standard perylene-d12 were qualified as estimates. All associated sample results were flagged accordingly.

With the exceptions noted above, the project-specific data quality objectives in terms of precision, accuracy, completeness, represenativeness, and comparability have been met.

3.2 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 $>2x$ 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 $>2x$ 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.

3.3 GC/MS TUNING AND CALIBRATION

Instrument calibration is performed to establish that the GC/MS instrument is capable of producing acceptable and reliable analytical data over a range of concentrations. The initial and continuing calibrations are performed according to CLP protocols and all results must meet validation requirements set by Westinghouse-Hanford (WHC 1992,b). An initial multipoint calibration is performed prior to sample analysis to establish the linear range of the GC/MS instrument. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All initial and continuing calibration results were acceptable.

3.4 BLANKS

3.4.1 Method Blanks

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or 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 <5X 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 <10x the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is <CRQL and is <10x (or <5x for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U". Tentatively identified compounds (TIC) present in the samples and blanks that are within +/-0.06 relative retention time units (RRT) of each other are qualified as undetected "U" if the sample concentration is <5x (or <10x for common laboratory contaminants) the highest blank concentration.

Due to the presence of positive blank results, sample numbers B0DMT2 and B0DMT3 in SDG No. W0429 were flagged "U" for aldol condensate.

Due to the presence of positive blank results, sample number B0DMT4 in SDG No. W0430 was flagged "U" for aldol condensate.

Due to the presence of positive blank results, sample numbers B0DMT2 and B0DMT3 in SDG No. W0429 were flagged "U" for butylbenzylphthalate.

Due to the presence of positive blank results, sample number B0DMT4 in SDG No. W0430 was flagged "U" for butylbenzylphthalate.

All other method blank results were acceptable.

3.5 ANALYTICAL ACCURACY

3.5.1 Matrix Spikes

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 five compounds and % recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results <5x 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 >5x the spike concentration require no qualification.

All matrix spike results were acceptable.

3.5.2 Surrogates

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. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Compounds with surrogate recoveries <10% are qualified as estimates "J" for detects, and "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification.

All surrogate recovery results were acceptable.

3.5.3 Internal Standards Performance

The evaluation of the internal standards criteria provide a means to assess the stability and sensitivity of the GC/MS system on every analysis. Internal standard area counts must be within the limits of -50% to +100% of the most recent standard. The retention time of the internal standard must not vary by more than +/-30 seconds of the most recent calibration. If area counts for a particular internal standard are outside the control limits or relative retention time criteria are > +/-30 seconds, all associated sample results are qualified as estimates (J for detects, UJ for non-detects). If area counts and retention times are both outside control limits, all non-detect sample results associated with that internal standard are qualified as unusable "UR".

Due to an internal standard recovery outside control limits, all results associated with internal standard perylene-d12 in SDG No. W0429 have been qualified as estimates and flagged "UJ/J".

All other internal standard recovery results were acceptable.

3.6 ANALYTICAL PRECISION

3.6.1 Matrix spike/matrix spike duplicates

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 soil samples analyzed using SW-846 protocol, results must be within RPD limits of +/-35%. If RPD values are out of specification and the sample concentration is <5x 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 >5x the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate RPD results were acceptable.

3.6.2 Field Duplicates

Field duplicate results are compared using the same guidelines for determining the RPD between a sample and its duplicate. Data are not qualified based on field duplicates.

There were no field duplicates associated with the subject SDGs.

3.7 COMPOUND IDENTIFICATION

The identity of detected compounds are confirmed to investigate the possibility of false positives or false negatives. If a compound was incorrectly reported as undetected, the associated result is qualified as detected (no qualifier) or estimated "J". If retention time and mass spectral criteria are exceeded, all associated results are qualified as unusable and flagged "R". If it is determined that incorrect identifications were made as a result of cross-contamination or carryover between analyses, then the affected data are qualified as unusable and flagged "UR/R".

All compounds were identified correctly.

3.8 SAMPLE RESULTS QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

The objective of a review of results quantitation and CRQLs is to determine if quantitation was performed accurately, CRQLs were calculated properly and that the project-specific CRQLs were met. Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data

were examined for anomalies transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

All sample results and reported detection limits were acceptable.

3.9 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate. Positive blank contamination was noted in all aldol condensate and butylbenzylphthalate results in both SDGs. The associated sample results were flagged accordingly. Due to an internal standard recovery outside control limits, all results in SDG No. W0429 associated with internal standard perylene-d12 were qualified as estimates and flagged "UJ/J". Data flagged "J" indicate the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All data packages submitted for validation were found to be 100% complete.

4.0 PESTICIDE/PCB DATA VALIDATION SUMMARY

4.1 SUMMARY

Due to calibration verification results outside QC limits, twelve compounds in SDG No. W0429 and eleven compounds in SDG No. W0430 were qualified as estimates. All associated sample results were flagged accordingly.

With the exceptions noted above, the project-specific data quality objectives in terms of precision, accuracy, completeness, represenativeness, and comparability have been met.

4.2 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 $>2x$ 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 $>2x$ 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.

4.3 GC/MS TUNING AND CALIBRATION

4.3.1 Initial Calibration

The laboratory performed an initial multipoint calibration for all target compounds at the concentration required by SW-846 protocols. The linearity of the initial calibration is established when the %RSD or the calibration factors are $<20\%$. If the RSD is $>20\%$, all detected results are qualified as estimates and flagged "J", and all non-detects are flagged "UJ".

All initial calibration results were acceptable.

4.3.2 Continuing Calibration

The criteria for acceptable continuing calibrations requires that the calibration factors for all target compounds have a percent difference of $\leq 15\%$ of the average calibration factor calculated for the associated initial calibration

standard. If the percent difference for the continuing calibrations is >15%, all associated results for that compound are qualified as estimates (J for detects, UJ for nondetects).

Continuing calibration results for DBC exceeded the 15% QC limit for heptachlor, aldrin, heptachlor epoxide, dieldrin, 4,4-DDE, endrin, endosulfan II, endosulfan sulfate, 4,4-DDT, endrin aldehyde and methoxychlor and for sample numbers B0DMT2 and B0DMT3 in SDG No. W0429. All associated sample results were qualified as estimates (J for detects, UJ for non-detects).

Continuing calibration results for DBC exceeded the 15% QC limit for alpha-BHC, beta-BHC, delta-BHC, 4,4-DDE, endrin, 4,4-DDD, heptachlor, 4,4-DDT, aroclor-1221, aroclor-1248 and methoxychlor for sample B0DMT4 in SDG No. W0430. All associated sample results were qualified as estimates and flagged "UJ"

All other calibration verification results were acceptable.

4.4 BLANKS

4.4.1 Method 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 concentrations >CRQL. If target compounds are present, sample results <5X the blank concentration are qualified as undetected "U". If the sample result is <5x the blank concentration and <CRQL, the result is qualified as undetected and elevated to the CRQL.

All method blank results were acceptable.

4.5 ANALYTICAL ACCURACY

4.5.1 Matrix Spikes

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 % recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results <5x 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 >5x the spike concentration require no qualification.

All matrix spike results were acceptable.

4.5.2 Surrogates

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 laboratory. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Compounds with surrogate recoveries $<10\%$ are qualified as estimates "J" for detects, and "UR" for nondetects. Undetected compounds with surrogate recoveries greater than the upper control limit require no qualification.

All surrogate recovery results were acceptable.

4.6 ANALYTICAL PRECISION

4.6.1 Matrix spike/matrix spike duplicates

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 soil samples analyzed using SW-846 protocol, results must be within RPD limits of +/-35%. If RPD values are out of specification and the sample concentration is $<5x$ 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 $>5x$ the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate RPD results were acceptable.

4.6.2 Field Duplicates

Field duplicate results are compared using the same guidelines for determining the RPD between a sample and its duplicate. Data are not qualified based on field duplicates.

There were no field duplicates associated with the subject SDGs.

4.7 COMPOUND IDENTIFICATION

The identity of detected compounds are confirmed to investigate the possibility of false positives or false negatives. If the qualitative criteria are not met, detected results are qualified as follows: Misidentified peaks outside the retention time window are reported to the CRQL level if no interferences are noted. If the misidentified peak interferes with a target peak then the reported value is qualified as estimated and undetected "UJ". If detected results have not been analyzed on dissimilar columns, results are qualified as unusable "R".

All compounds were identified correctly.

4.8 SAMPLE RESULTS QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

The objective of a review of results quantitation and CRQLs is to determine if quantitation was performed accurately, CRQLs were calculated properly and that the project-specific CRQLs were met. Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

All sample results and reported detection limits were acceptable.

4.9 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate. Due to calibration verification results outside QC limits, twelve compounds in SDG No. W0429 and eleven compounds in SDG No. W0430 were qualified as estimates (J for detects, UJ for nondetects). Data flagged "J" indicate the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All data packages submitted for validation were found to be 100% complete.

5.0 METALS DATA VALIDATION SUMMARY

5.1 SUMMARY

Negative blank contamination was detected in one sample. Minor matrix spike recovery problems were noted for three analytes in one sample delivery group. All associated sample results were flagged accordingly.

With the exceptions noted above, the project-specific data quality objectives in terms of precision, accuracy, completeness, represenativeness, and comparability have been met.

5.2 HOLDING TIMES

Analytical holding times for ICP metals and GFAA metals analyses were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be analyzed within six months for all metals.

Holding times were met for all samples.

5.3 CALIBRATIONS

Performance of specific instrument quality assurance and quality control procedures, including deficiencies noted during the quality assurance review, are outlined below.

Three calibration standards and a blank were analyzed for arsenic, lead, selenium and thallium by GFAA. The correlation coefficient of a least squares linear regression met the requirements for calibration in all cases.

At least one standard and a blank were analyzed by ICP for all other elements.

The above calibrations were each immediately verified with an ICV standard and a calibration blank. The ICV was prepared from a source independent of the calibration standards, at a mid-calibration range concentration. The ICV percent recovery must fall within the control limits of 90% to 110% for metals analyzed by ICP and GFAA. Calibration linearity near the detection limit was verified with a standard prepared at a concentration near the CRDL.

The ICVs met the recommended control limits in all cases.

The calibrations were subsequently verified at regular intervals using a CCV standard. The control windows for percent recovery of CCV standards are the same as the ICV windows described above.

The CCVs met the recommended control limits in all cases.

5.3.1 ICP Calibration

An ICS was analyzed at the beginning and end of each ICP sample run to verify the laboratory interelement and background correction factors. Results for the ICS solution must fall within the control limit of ±20% of the true value.

Under the ICP method, an ICS is required for lead at a concentration of 1.0 mg/L. Refer to Table 2, page E-14, of the USEPA CLP ILM01.0.

The ICS has been analyzed at the proper frequency and all ICSAB solution percent recovery values fell within the control limit.

5.3.2 Atomic Absorption Calibrations

Duplicate injections are required for all GFAA analyses. The duplicate injections establish the precision of the individual analytical determinations. For sample concentrations >CRDL, duplicate injections must agree within ±20% RSD or CV.

All duplicate injection quality control requirements were met.

5.4 BLANKS

5.4.1 Calibration Blanks

A calibration blank must be analyzed at each wavelength used for analysis immediately after every initial and continuing calibration verification, at a frequency of 10% or every two hours during the run. The blank must be analyzed at the beginning of the run and after the last analytical sample. A CCB must be run after the last CCV following the last analytical sample of the run. In the case of positive blank results, samples with results (in ug/L) of (<5x) the highest amount found in any of the associated blanks have had their associated values qualified as non-detected and flagged "U". Samples with concentrations (>5x) the highest blank value do not require qualification.

If the absolute value of any negative calibration blank exceeds the IDL, all non-detects are qualified as estimates and flagged "UJ". All associated positive results within (2x) the absolute blank value are qualified as estimates and flagged

"J". The qualification applies only to results generated between the associated calibration blank and the nearest acceptable calibration blank.

All calibration blank results were acceptable.

5.4.2 Preparation Blanks

At least one preparation blank, consisting of deionized distilled water must be prepared and analyzed with every sample delivery group. In the case of positive blank results, samples with results (in ug/L) of (<5x) the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of (>5x) the highest blank concentration do not require qualification.

If the absolute value of the negative preparation blank exceeds the CRDL, all associated undetected results are rejected and flagged "UR". All associated detects that are (<10x) the absolute value of the preparation blank result are qualified as estimates and flagged "J". If the sample results are (>10x) the absolute value of the preparation blank, no qualification is necessary. If the absolute value of the negative preparation blank is >IDL and $\leq$CRDL, all associated non-detected sample results are qualified as estimates and flagged "UJ". All associated detects (<10x) the absolute value of the preparation blank are qualified as estimates and flagged "J".

Due to the presence of a negative preparation blank result, sample number B0DMT4 in SDG No. W0430 was flagged "BJ" for beryllium.

All other preparation blank results were acceptable.

5.5 ACCURACY

5.5.1 Matrix Spike Samples

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 <30% and a sample value below the IDL were rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result <IDL are qualified "UJ". Samples with a spike recovery of >125% or <75% and a sample result >IDL are qualified "J". All samples with a spike recovery >125% and a sample result <IDL require no qualification.

The matrix spike recovery fell outside QC limits for antimony in sample number B0DMT4 in SDG No. W0430. Therefore, the associated result was qualified as an estimate and flagged "BJ".

The matrix spike recovery fell outside QC limits for manganese in sample number B0DMT4 in SDG No. W0430. Therefore, the associated result was qualified as an estimate and flagged "J".

The matrix spike recovery fell outside QC limits for thallium in sample number B0DMT4 in SDG No. W0430. Therefore, the associated result was qualified as an estimate and flagged "UJ".

All other matrix spike recovery results were acceptable.

5.5.2 Laboratory Control Samples

The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be digested or distilled and analyzed with every group of samples which have been prepared together. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

One LCS was digested and analyzed for each sample batch in this report.

All LCS results were acceptable.

5.5.3 GFAA Analytical Spikes

The post-digestion analytical spike is analyzed to determine the extent of interference in the sample matrix. The analytical spike recoveries establish the accuracy of the individual GFAA determinations.

Positive sample results whose analytical spike results are outside the 85% to 115% control limit, but whose absorbances are <50% of the analytical spike absorbance, are qualified as estimates and flagged "J". In cases where the analytical spike recovery was <10 percent, all non-detects are qualified as rejects and flagged "UR".

No analytical spike results were determined for the SDGs in this report. No qualification of data was necessary since GFAA analytical spikes are not required by SW-846 validation guidelines.

5.5.4 Method of Standard Addition (MSA) Results

For all samples whose analytical spike results are outside the 85% to 115% control limit and whose absorbances are >50% of the analytical spike absorbance, an MSA is required. In cases where the MSA correlation coefficient was <0.995, the MSA analysis was repeated once. If the correlation coefficient was still <0.995, samples were qualified as estimates and flagged "J". If a sample required MSA analysis but was not analyzed, all associated data must be qualified as estimates and flagged "J".

All MSA results were acceptable.

5.6 ANALYTICAL PRECISION

5.6.1 Laboratory Duplicate Samples

The laboratory duplicate results assess the precision of the method by measuring a second aliquot of the sample that is treated the same way as the original. If the RPD of the original sample and its duplicate is >35% and the positive sample result is (>5x) the CRDL, the associated sample result is qualified as an estimate and flagged "J". Also, if the difference between the duplicate samples is $> \pm$CRDL and the positive sample result is (<5x) the CRDL, the associated sample result is qualified as an estimate and flagged "J".

All laboratory duplicate recovery results were acceptable.

5.6.2 ICP Serial Dilution

The ICP serial dilution is used to determine whether significant physical or chemical interferences exist due to sample matrix. If a sample concentration is ($\geq$50x) the IDL for an analyte and the %D is outside the $\pm$10% control limits the associated data must be qualified as estimates and flagged "J".

No ICP serial dilution was analyzed with the SDGs in this report. No data was qualified since SW-846 methods do not require dilution analysis unless sample concentrations are greater than the linear range of the instrument.

5.6.3 Field Duplicates

Field duplicate results are compared using the same guidelines for determining the RPD between a sample and its duplicate. Data are not qualified based on field duplicates.

There were no field duplicates associated with the subject SDGs.

5.6.4 Field Split Samples

A field split sample is a representative sample from a sampling event that is sent to a third party laboratory. The field split sample results are evaluated by comparing the corresponding sample results to the reference laboratory sample results. Data qualification is not required for field splits.

There were no field splits associated with the subject SDGs.

5.6.5 GFAA Duplicate Injections

Each GFAA analysis requires a minimum of two injections (burns), except for full MSAs. The RSD for the duplicate injections must be within the control limits of $\pm$20% for samples with concentrations >CRQL. If these requirements are not met, the analytical sample must be rerun once (i.e., two additional burns). If the readings are then still outside the QC limits, the result is qualified as an estimate and flagged "J".

All duplicate injection quality control requirements were met.

5.7 SAMPLE RESULT QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

The objective of reviewing analyte quantitation and detection limits is to verify that results are calculated and transcribed properly and that project-specific detection limits were met.

Twenty percent of sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. All sample detection limits were checked to meet the required detection limits.

The reviewer verified that the results and detection limits fell within the linear range of the instrument. All sample results and reported detection limits were acceptable.

5.8 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate. Negative blank contamination was detected in one beryllium sample in SDG No. W0430. The associated sample result was flagged accordingly. Contamination, however, was not significantly high enough to affect the usability of the data. Due to matrix

spike recovery problems, antimony, manganese and thallium results in SDG No. W0430 were qualified as estimates and flagged (BJ, J, or UJ). Data flagged "J" indicates that the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All data packages submitted for validation were found to be 100% complete.

6.0 GENERAL CHEMISTRY DATA VALIDATION SUMMARY

6.1 SUMMARY

The project-specific data quality objectives in terms of precision, accuracy, completeness, represenativeness, and comparability have been met.

6.2 HOLDING TIMES

Analytical holding times for fluoride, sulfate, chloride, sulfide, nitrate, nitrite, phosphate, nitrate/nitrite and TOX were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 28 days for chloride, fluoride, sulfate, TOX and nitrate/nitrite; seven days for sulfide; and two days for nitrate, nitrite and phosphate.

If holding times are exceeded, but not by ($>2x$) 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 ($>2x$) 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 for all analytes met QC requirements.

6.3 CALIBRATIONS

6.3.1 Initial Calibration

The following calibration procedures must be conducted:

- At least one blank and three standards were used to establish the ion chromatography, ion selective electrode, and spectrophotometer calibrations prior to sample analysis with a correlation ≥ 0.995.
- At least two reference buffers or standards at a high and low concentration were used to calibrate the pH and conductivity meters.

If any of these initial calibration requirements are not met, all associated data are qualified "J" for detects and "UJ" for non-detects.

All initial calibration results were acceptable.

6.3.2 Continuing Calibration Verification

All CCV standards must be analyzed within the required frequency or every 20 samples. The % recoveries must fall within the 90%-110% acceptance windows. If the recoveries fell outside this window, then all associated detects are qualified as estimates and flagged "J" and all non-detects are flagged "UJ".

All continuing calibration results were acceptable.

6.4 BLANKS

6.4.1 Laboratory Blanks

At least one laboratory preparation blank must be analyzed with each sample batch. At least one initial calibration blank must be analyzed for every 20 samples. As per WHC guidelines, no qualification of data based on blank contamination and continuing calibration blanks is required.

All laboratory blank results were acceptable.

6.5 ACCURACY

6.5.1 Matrix Spike Recovery

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 $<30\%$ and a sample value below the IDL are rejected and flagged "UR". Samples with a spike recovery between 30% and 74% and a sample value below the IDL are qualified as estimates and flagged "UJ". Samples with a spike recovery of $<75\%$ or $>125\%$ and a sample value $>$IDL are qualified as "J". Finally, samples with a spike recovery of $>125\%$ and a sample value $<$IDL are acceptable and do not require qualification.

All matrix spike recovery results were acceptable.

6.5.2 Laboratory Control Sample Recovery

The LCS monitors the overall performance of all steps in the analysis, including the sample preparation. An LCS should be prepared (e.g., digested or distilled) and analyzed with every group of samples which have been prepared together. The performance criteria for aqueous LCS percent recovery is 80% to 120%. The performance criteria for solid LCS samples are established by the manufacturer or the laboratory.

ICV results obtained from the raw data were used to calculate LCS results. All LCS results were found to be acceptable.

6.6 PRECISION

6.6.1 Laboratory Duplicates

The laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Laboratory duplicate RPDs must fall below 20% for waters and 35% for soils. If an RPD for an aqueous sample is >20% and the sample result is (>5x) the CRDL, all associated detects are qualified as estimates and flagged "J". If the range between duplicate aqueous samples is $>\pm$CRDL and the sample result is (<5x) the CRDL, all associated detects are qualified as estimates and flagged "J". If an RPD for soil samples is >35% and the sample result is (>5x) the CRDL, all associated detects are flagged "J". If the range between duplicate soil samples is $>\pm$2CRDL and the sample result is (<5x) the CRDL, then all detects are flagged "J".

All laboratory duplicate results were acceptable.

6.6.2 Field Duplicates

Field duplicate sample analyses are used to measure both the lab and field sampling procedure precision. Field duplicate results are compared using the same guidelines for determining the precision between a sample and its duplicate. Data are not qualified based on field duplicates.

There were no field duplicates associated with the subject SDGs.

6.6.3 Field Split Samples

A field split sample is a representative sample from a sampling event that is sent to a third party laboratory. Field split sample results are evaluated by comparing the corresponding sample results to the reference laboratory sample results. Data qualification is not required for field splits.

There were no field splits associated with the subject SDGs.

6.7 SAMPLE RESULT QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

The data was reviewed to verify that the results were calculated properly. The sample results and detection limits were evaluated to ensure that all analytes were analyzed and reported accurately. Raw data were examined for anomalies,

transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

All sample results and reported detection limits were acceptable.

6.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicate that instrument performance was adequate. All validated results are considered accurate within the standard error associated with the methods.

All packages submitted for validation were found to be complete, resulting in an overall completeness of 100%.

7.0 RADIOCHEMISTRY DATA VALIDATION SUMMARY

7.1 SUMMARY

Radium-228 results for all samples in SDG No. W0429 were qualified as estimates due to the lack of a duplicate analysis. Uranium-238 results for all samples in SDG No. W0429 were qualified as estimates due to a laboratory duplicate RPD of 39%. All associated sample results were flagged accordingly.

With the exceptions noted above, the project-specific data quality objectives in terms of precision, accuracy, completeness, represenativeness, and comparability have been met.

7.2 HOLDING TIMES AND SAMPLE PREPARATION

Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analyses is six months. Tritium sample preparation requires distillation. Tritium samples must be analyzed within seven days of distillation.

All holding times and sample preparation measures were acceptable.

7.3 CALIBRATIONS

Instrument calibration is performed to establish that the counters used to determine radionuclide activities are capable of producing acceptable and reliable analytical data. Each counting system must be factory calibrated at installation and after any maintenance or repair. Calibration consists of an instrument efficiency determination for each applicable radionuclide. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible.

All calibration results, including efficiency checks and background counts, were acceptable.

7.4 LABORATORY BLANKS

Laboratory 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 were applied: All positive sample results (<5x) the highest blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and (>5x) the highest blank concentration were not qualified.

All laboratory blank results were acceptable.

7.5 ACCURACY

7.5.1 Laboratory Control and Matrix Spike Samples

Accuracy was evaluated by analyzing soil or distilled water 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%. Spike sample results outside the above ranges resulted in associated sample results being qualified as estimated, rejected, or not qualified, depending on the activity of the individual sample.

All laboratory control and matrix spike sample results were acceptable.

7.6 PRECISION

7.6.1 Laboratory Duplicates

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. If both sample and replicate activities are >5xCRDL and the RPD is $<35\%$ for soil samples and $<20\%$ for water samples, the results are acceptable. If either activities are <5xCRDL, a control limit of ≤ 2xCRDL is used for soil samples and $\leq$CRDL for water samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

Radium-228 results for all samples in SDG No. W0429 were qualified as estimates and flagged "J" due to the lack of a duplicate analysis.

Uranium-238 results for all samples in SDG No. W0429 were qualified as estimates and flagged "J" due to a RPD of 39%.

All other laboratory duplicate results were acceptable.

7.6.2 Field Duplicates

Field duplicate results are compared using the same guidelines for determining the RPD between a sample and its duplicate. Data qualification is not required for field duplicate RPDs.

There were no field duplicates associated with the subject SDGs.

7.6.3 Field Split Samples

A field split sample is a representative sample from a sampling event that is sent to a third party laboratory. The field split sample results are evaluated by comparing the corresponding sample results to the reference laboratory sample results. Data qualification is not required for field splits.

There were no field splits associated with the subject SDGs.

7.7 SAMPLE RESULTS QUANTITATION, VERIFICATION AND REPORTED DETECTION LIMITS

Twenty percent of sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. The MDA for each analyte was assessed to ensure that it met the CRDL.

The reviewer verified that the results and detection limits fell within the linear range of the instrument. All data packages submitted for validation were found to be complete. All sample results and reported detection limits were acceptable.

7.8 SYSTEM PERFORMANCE AND OVERALL ASSESSMENT

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate for these analyses. Due to the lack of a duplicate analysis, all radium-228 results in SDG No. W0429 were qualified as estimates and flagged "J". All uranium-238 results in SDG No. W0429 were qualified as estimates due to a laboratory duplicate RPD of 39%. Data flagged "J" indicate the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

All data packages submitted for validation were found to be 100% complete.

8.0 REFERENCES

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APPENDICES

APPENDIX A

VOLATILE ORGANIC DATA SUMMARY TABLES

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (µg/Kg)

Project: WESTINGHOUSE–HANFORD																			
Laboratory: QUANTERRA																			
Case:	SDG: W0429																		
Sample Number		B0DMT2		B0DMT3															
Location		Test Pit #2		Test Pit #2															
Remarks																			
Sample Date		01/17/95		01/17/95															
Analysis Date		01/25/95		01/26/95															
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	18	U	31	U														
Bromomethane	10	18	U	31	U														
Vinyl Chloride	10	18	U	31	U														
Chloroethane	10	18	U	31	U														
Methylene Chloride	10	20	U	74	U														
Acetone	10	43	U	51	U														
Carbon Disulfide	10	9	U	16	U														
1,1–Dichloroethene	10	9	U	16	U														
1,1–Dichloroethane	10	9	U	16	U														
1,2–Dichloroethene (total)	10	9	U	16	U														
Chloroform	10	9	U	16	U														
1,2–Dichloroethane	10	9	U	16	U														
2–Butanone	10	180	U	310	U														
1,1,1–Trichloroethane	10	9	U	16	U														
Carbon Tetrachloride	10	9	U	16	U														
Bromodichloromethane	10	9	U	16	U														
1,2–Dichloropropane	10	9	U	16	U														
cis–1,3–Dichloropropene	10	9	U	16	U														
Trichloroethene	10	9	U	16	U														
Dibromochloromethane	10	9	U	16	U														
1,1,2–Trichloroethane	10	9	U	16	U														
Benzene	10	9	U	16	U														
trans–1,3–Dichloropropene	10	9	U	16	U														
Bromoform	10	9	U	16	U														
4–Methyl–2–pentanone	10	89	U	160	U														
2–Hexanone	10	89	U	160	U														
Tetrachloroethene	10	9	U	16	U														
1,1,2,2–Tetrachloroethane	10	9	U	16	U														
Toluene	10	9	U	16	U														
Chlorobenzene	10	9	U	16	U														
Ethylbenzene	10	9	U	16	U														
Styrene	10	9	U	16	U														
Xylene (total)	10	9	U	16	U														

RJS 5/3/95

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (µg/Kg)

Project: WESTINGHOUSE–HANFORD																			
Laboratory: QUANTERRA																			
Case:	SDG: W0430																		
Sample Number		B0DMT4																	
Location		Test Pit #2																	
Remarks																			
Sample Date		01/27/95																	
Analysis Date		02/06/95																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	11	U																
Bromomethane	10	11	U																
Vinyl Chloride	10	11	U																
Chloroethane	10	11	U																
Methylene Chloride	10	11	U																
Acetone	10	110	U																
Carbon Disulfide	10	5	U																
1,1–Dichloroethene	10	5	U																
1,1–Dichloroethane	10	5	U																
1,2–Dichloroethene (total)	10	5	U																
Chloroform	10	5	U																
1,2–Dichloroethane	10	5	U																
2–Butanone	10	110	U																
1,1,1–Trichloroethane	10	5	U																
Carbon Tetrachloride	10	5	U																
Bromodichloromethane	10	5	U																
1,2–Dichloropropane	10	5	U																
cis–1,3–Dichloropropene	10	5	U																
Trichloroethene	10	5	U																
Dibromochloromethane	10	5	U																
1,1,2–Trichloroethane	10	5	U																
Benzene	10	5	U																
trans–1,3–Dichloropropene	10	5	U																
Bromoform	10	5	U																
4–Methyl–2–pentanone	10	53	U																
2–Hexanone	10	53	U																
Tetrachloroethene	10	5	U																
1,1,2,2–Tetrachloroethane	10	5	U																
Toluene	10	5	U																
Chlorobenzene	10	5	U																
Ethylbenzene	10	5	U																
Styrene	10	5	U																
Xylene (total)	10	5	U																

RJS 5/5/95

APPENDIX B

VOLATILE ORGANIC VALIDATED LABORATORY REPORT FORMS

9613497 1381

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0621

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 Date Analyzed: 01/25/95

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	18	U
74-83-9	Bromomethane	18	U
75-01-4	Vinyl Chloride	18	U
75-00-3	Chloroethane	18	U
75-09-2	Methylene Chloride	20	~~B~~ U
67-64-1	Acetone	43	~~B~~ U
75-15-0	Carbon Disulfide	9	U
75-35-4	1,1-Dichloroethene	9	U
75-34-3	1,1-Dichloroethane	9	U
540-59-0	1,2-Dichloroethene (total)	9	U
67-66-3	Chloroform	9	U
107-06-2	1,2-Dichloroethane	9	U
78-93-3	2-Butanone	180	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
75-27-4	Bromodichloromethane	9	U
78-87-5	1,2-Dichloropropane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
79-01-6	Trichloroethene	9	U
124-48-1	Dibromochloromethane	9	U
79-00-5	1,1,2-Trichloroethane	9	U
71-43-2	Benzene	9	U
10061-02-6	trans-1,3-Dichloropropene	9	U
75-25-2	Bromoform	9	U
108-10-1	4-Methyl-2-Pentanone	89	U
591-78-6	2-Hexanone	89	U
127-18-4	Tetrachloroethene	9	U
79-34-5	1,1,2,2-Tetrachloroethane	9	U
108-88-3	Toluene	9	U
108-90-7	Chlorobenzene	9	U
100-41-4	Ethylbenzene	9	U
100-42-5	Styrene	9	U
1330-20-7	Xylene (total)	9	U

1a

3/27/95 SC

~~000078~~

9613497.1382
1E

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0DMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0621

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 Date Analyzed: 01/25/95

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

3/27/95 SC

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0635

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 Date Analyzed: 01/26/95

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	31	U
74-83-9	Bromomethane	31	U
75-01-4	Vinyl Chloride	31	U
75-00-3	Chloroethane	31	U
75-09-2	Methylene Chloride	74	B
67-64-1	Acetone	51	BJ
75-15-0	Carbon Disulfide	16	U
75-35-4	1,1-Dichloroethene	16	U
75-34-3	1,1-Dichloroethane	16	U
540-59-0	1,2-Dichloroethene (total)	16	U
67-66-3	Chloroform	16	U
107-06-2	1,2-Dichloroethane	16	U
78-93-3	2-Butanone	310	U
71-55-6	1,1,1-Trichloroethane	16	U
56-23-5	Carbon Tetrachloride	16	U
75-27-4	Bromodichloromethane	16	U
78-87-5	1,2-Dichloropropane	16	U
10061-01-5	cis-1,3-Dichloropropene	16	U
79-01-6	Trichloroethene	16	U
124-48-1	Dibromochloromethane	16	U
79-00-5	1,1,2-Trichloroethane	16	U
71-43-2	Benzene	16	U
10061-02-6	trans-1,3-Dichloropropene	16	U
75-25-2	Bromoform	16	U
108-10-1	4-Methyl-2-Pentanone	160	U
591-78-6	2-Hexanone	160	U
127-18-4	Tetrachloroethene	16	U
79-34-5	1,1,2,2-Tetrachloroethane	16	U
108-88-3	Toluene	16	U
108-90-7	Chlorobenzene	16	U
100-41-4	Ethylbenzene	16	U
100-42-5	Styrene	16	U
1330-20-7	Xylene (total)	16	U

3/27/95 SC

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000050

9613497.1384

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0635

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 Date Analyzed: 01/26/95

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

3/27/95 SC

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT4

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMP Case No.: V44408 SDG No.: W0430

Matrix: (soil/water) SOIL Lab Sample ID: 7444-008

Sample wt/vol: 5.00 (g/mL) G Lab File ID: E2000

Level: (low/med) LOW Date Received: 01/30/95

% Moisture: not dec. 6 Date Analyzed: 02/06/95

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	11	U
74-83-9	Bromomethane	11	U
75-01-4	Vinyl Chloride	11	U
75-00-3	Chloroethane	11	U
75-09-2	Methylene Chloride	11 ~~8~~	~~B~~ U
67-64-1	Acetone	110	U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	110	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-Pentanone	53	U
591-78-6	2-Hexanone	53	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

~~1015~~

3/30/95 SC

9613497.1396

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0DMT4

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMP Case No.: V44408 SDG No.: W0430

Matrix: (soil/water) SOIL Lab Sample ID: 7444-008

Sample wt/vol: 5.00 (g/mL) G Lab File ID: E2000

Level: (low/med) LOW Date Received: 01/30/95

% Moisture: not dec. 6 Date Analyzed: 02/06/95

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

3/30/95 SC

~~0016~~

APPENDIX C

SEMI-VOLATILE ORGANIC DATA SUMMARY TABLES

SEMI–VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (µg/Kg)

Project: WESTINGHOUSE–HANFORD																					
Laboratory: QUANTERRA																					
Case:	SDG: W0429																				
Sample Number		B0DMT2		B0DMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks																					
Sample Date		01/17/95		01/17/95																	
Extraction Date		01/20/95		01/20/95																	
Analysis Date		01/23/95		01/23/95																	
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	1200	U	2100	U																
bis(2–Chloroethyl)ether	330	1200	U	2100	U																
2–Chlorophenol	330	1200	U	2100	U																
1,3–Dichlorobenzene	330	1200	U	2100	U																
1,4–Dichlorobenzene	330	1200	U	2100	U																
1,2–Dichlorobenzene	330	1200	U	2100	U																
2–Methylphenol	330	1200	U	2100	U																
2,2'–oxybis(1–Chloropropane)	330	1200	U	2100	U																
4–Methylphenol	330	1200	U	2100	U																
N–Nitroso–di–n–propylamine	330	1200	U	2100	U																
Hexachloroethane	330	1200	U	2100	U																
Nitrobenzene	330	1200	U	2100	U																
Isophorone	330	1200	U	2100	U																
2–Nitrophenol	330	1200	U	2100	U																
2,4–Dimethylphenol	330	1200	U	2100	U																
bis(2–Chloroethoxy)methane	330	1200	U	2100	U																
2,4–Dichlorophenol	330	1200	U	2100	U																
1,2,4–Trichlorobenzene	330	1200	U	2100	U																
Naphthalene	330	1200	U	2100	U																
4–Chloroaniline	1700	2300	U	4100	U																
Hexachlorobutadiene	330	1200	U	2100	U																
4–Chloro–3–methylphenol	1700	2300	U	4100	U																
2–Methylnaphthalene	330	1200	U	2100	U																
Hexachlorocyclopentadiene	330	1200	U	2100	U																
2,4,6–Trichlorophenol	330	1200	U	2100	U																
2,4,5–Trichlorophenol	330	1200	U	2100	U																
2–Chloronaphthalene	330	1200	U	2100	U																
2–Nitroaniline	1700	5900	U	10000	U																
Dimethylphthalate	330	1200	U	2100	U																
Acenaphthylene	330	1200	U	2100	U																
2,6–Dinitrotoluene	330	1200	U	2100	U																

RJS 5/3/95

Project: WESTINGHOUSE-HANFORD																					
Laboratory: QUANTERRA																					
Case:	SDG: W0429																				
Sample Number		B0DMT2		B0DMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks																					
Sample Date		01/17/95		01/17/95																	
Extraction Date		01/20/95		01/20/95																	
Analysis Date		01/23/95		01/23/95																	
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	1700	5900	U	10000	U																
Acenaphthene	330	1200	U	2100	U																
2,4-Dinitrophenol	1700	5900	U	10000	U																
4-Nitrophenol	1700	5900	U	10000	U																
Dibenzofuran	330	1200	U	2100	U																
2,4-Dinitrotoluene	330	1200	U	2100	U																
Diethylphthalate	330	1200	U	2100	U																
4-Chlorophenyl-phenyl ether	330	1200	U	2100	U																
Fluorene	330	1200	U	2100	U																
4-Nitroaniline	1700	2300	U	4100	U																
4,6-Dinitro-2-methylphenol	1700	5900	U	10000	U																
N-Nitrosodiphenylamine	330	1200	U	2100	U																
4-Bromophenyl-phenylether	330	1200	U	2100	U																
Hexachlorobenzene	330	1200	U	2100	U																
Pentachlorophenol	1700	5900	U	10000	U																
Phenanthrene	330	440	J	470	J																
Anthracene	330	430	J	460	J																
Carbazole	330	1200	U	2100	U																
Di-n-butylphthalate	330	170	J	2100	U																
Fluoranthene	330	590	J	940	J																
Pyrene	330	570	J	820	J																
Butylbenzylphthalate	330	1200	U	2100	U																
3,3'-Dichlorobenzidine	330	2300	U	4100	U																
Benzo(a)anthracene	330	180	J	340	J																
Chrysene	330	220	J	400	J																
bis(2-Ethylhexyl)phthalate	330	81	J	130	J																
Di-n-octylphthalate	330	1200	UJ	2100	UJ																
Benzo(b)fluoranthene	330	420	J	580	J																
Benzo(k)fluoranthene	330	130	J	220	J																
Benzo(a)pyrene	330	1200	UJ	290	J																
Indeno(1,2,3-cd)pyrene	330	1200	UJ	2100	UJ																
Dibenz(a,h)anthracene	330	1200	UJ	2100	UJ																
Benzo(g,h,i)perylene	330	1200	UJ	2100	UJ																

SEMI-VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (µg/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: QUANTERRA																					
Case:	SDG: W0430																				
Sample Number		B0DMT4																			
Location		Test Pit #2																			
Remarks																					
Sample Date		01/27/95																			
Extraction Date		02/02/95																			
Analysis Date		02/06/95																			
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	700	U																		
bis(2-Chloroethyl)ether	330	700	U																		
2-Chlorophenol	330	700	U																		
1,3-Dichlorobenzene	330	700	U																		
1,4-Dichlorobenzene	330	700	U																		
1,2-Dichlorobenzene	330	700	U																		
2-Methylphenol	330	700	U																		
2,2'-oxybis(1-Chloropropane)	330	700	U																		
4-Methylphenol	330	700	U																		
N-Nitroso-di-n-propylamine	330	700	U																		
Hexachloroethane	330	700	U																		
Nitrobenzene	330	700	U																		
Isophorone	330	700	U																		
2-Nitrophenol	330	700	U																		
2,4-Dimethylphenol	330	700	U																		
bis(2-Chloroethoxy)methane	330	700	U																		
2,4-Dichlorophenol	330	700	U																		
1,2,4-Trichlorobenzene	330	700	U																		
Naphthalene	330	700	U																		
4-Chloroaniline	1700	1400	U																		
Hexachlorobutadiene	330	700	U																		
4-Chloro-3-methylphenol	1700	1400	U																		
2-Methylnaphthalene	330	700	U																		
Hexachlorocyclopentadiene	330	700	U																		
2,4,6-Trichlorophenol	330	700	U																		
2,4,5-Trichlorophenol	330	700	U																		
2-Chloronaphthalene	330	700	U																		
2-Nitroaniline	1700	3500	U																		
Dimethylphthalate	330	700	U																		
Acenaphthylene	330	700	U																		
2,6-Dinitrotoluene	330	700	U																		

5/5/95

Project: WESTINGHOUSE-HANFORD																					
Laboratory: QUANTERRA																					
Case:	SDG: W0430																				
Sample Number		B0DMT4																			
Location		Test Pit #2																			
Remarks																					
Sample Date		01/27/95																			
Extraction Date		02/02/95																			
Analysis Date		02/06/95																			
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	1700	3500	U																		
Acenaphthene	330	700	U																		
2,4-Dinitrophenol	1700	3500	U																		
4-Nitrophenol	1700	3500	U																		
Dibenzofuran	330	700	U																		
2,4-Dinitrotoluene	330	700	U																		
Diethylphthalate	330	700	U																		
4-Chlorophenyl-phenyl ether	330	700	U																		
Fluorene	330	700	U																		
4-Nitroaniline	1700	1400	U																		
4,6-Dinitro-2-methylphenol	1700	3500	U																		
N-Nitrosodiphenylamine	330	700	U																		
4-Bromophenyl-phenylether	330	700	U																		
Hexachlorobenzene	330	700	U																		
Pentachlorophenol	1700	3500	U																		
Phenanthrene	330	700	U																		
Anthracene	330	700	U																		
Carbazole	330	700	U																		
Di-n-butylphthalate	330	700	U																		
Fluoranthene	330	700	U																		
Pyrene	330	700	U																		
Butylbenzylphthalate	330	700	U																		
3,3'-Dichlorobenzidine	330	1400	U																		
Benzo(a)anthracene	330	700	U																		
Chrysene	330	700	U																		
bis(2-Ethylhexyl)phthalate	330	700	U																		
Di-n-octylphthalate	330	700	U																		
Benzo(b)fluoranthene	330	700	U																		
Benzo(k)fluoranthene	330	700	U																		
Benzo(a)pyrene	330	700	U																		
Indeno(1,2,3-cd)pyrene	330	700	U																		
Dibenz(a,h)anthracene	330	700	U																		
Benzo(g,h,i)perylene	330	700	U																		

RJS 5/3/95

APPENDIX D

SEMI-VOLATILE ORGANIC VALIDATED LABORATORY REPORT FORMS

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	1200	U
111-44-4	bis(2-Chloroethyl)Ether	1200	U
95-57-8	2-Chlorophenol	1200	U
541-73-1	1,3-Dichlorobenzene	1200	U
106-46-7	1,4-Dichlorobenzene	1200	U
95-50-1	1,2-Dichlorobenzene	1200	U
95-48-7	2-Methylphenol	1200	U
108-60-1	2,2'-oxybis(1-Chloropropane)	1200	U
106-44-5	4-Methylphenol	1200	U
621-64-7	N-Nitroso-Di-n-Propylamine	1200	U
67-72-1	Hexachloroethane	1200	U
98-95-3	Nitrobenzene	1200	U
78-59-1	Isophorone	1200	U
88-75-5	2-Nitrophenol	1200	U
105-67-9	2,4-Dimethylphenol	1200	U
111-91-1	bis(2-Chloroethoxy)Methane	1200	U
120-83-2	2,4-Dichlorophenol	1200	U
120-82-1	1,2,4-Trichlorobenzene	1200	U
91-20-3	Naphthalene	1200	U
106-47-8	4-Chloroaniline	2300	U
87-68-3	Hexachlorobutadiene	1200	U
59-50-7	4-Chloro-3-Methylphenol	2300	U
91-57-6	2-Methylnaphthalene	1200	U
77-47-4	Hexachlorocyclopentadiene	1200	U
88-06-2	2,4,6-Trichlorophenol	1200	U
95-95-4	2,4,5-Trichlorophenol	1200	U
91-58-7	2-Chloronaphthalene	1200	U
88-74-4	2-Nitroaniline	5900	U
131-11-3	Dimethyl Phthalate	1200	U
208-96-8	Acenaphthylene	1200	U
606-20-2	2,6-Dinitrotoluene	1200	U

3/27/95 SC

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1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG		Q
99-09-2	3-Nitroaniline		5900	U
83-32-9	Acenaphthene		1200	U
51-28-5	2,4-Dinitrophenol		5900	U
100-02-7	4-Nitrophenol		5900	U
132-64-9	Dibenzofuran		1200	U
121-14-2	2,4-Dinitrotoluene		1200	U
84-66-2	Diethylphthalate		1200	U
7005-72-3	4-Chlorophenyl-phenylether		1200	U
86-73-7	Fluorene		1200	U
100-01-6	4-Nitroaniline		2300	U
534-52-1	4,6-Dinitro-2-Methylphenol		5900	U
86-30-6	N-Nitrosodiphenylamine (1)		1200	U
101-55-3	4-Bromophenyl-phenylether		1200	U
118-74-1	Hexachlorobenzene		1200	U
87-86-5	Pentachlorophenol		5900	U
85-01-8	Phenanthrene		440	J
120-12-7	Anthracene		430	J
86-74-8	Carbazole		1200	U
84-74-2	Di-n-Butylphthalate		170	J
206-44-0	Fluoranthene		590	J
129-00-0	Pyrene		570	J
85-68-7	Butylbenzylphthalate	1200	~~820~~	~~BJ~~ U
91-94-1	3,3'-Dichlorobenzidine		2300	U
56-55-3	Benzo(a)Anthracene		180	J
218-01-9	Chrysene		220	J
117-81-7	bis(2-Ethylhexyl)Phthalate		81	J
117-84-0	Di-n-Octyl Phthalate		1200	~~U~~ UJ
205-99-2	Benzo(b)Fluoranthene		420	~~J~~ UJ
207-08-9	Benzo(k)Fluoranthene		130	~~J~~ UJ
50-32-8	Benzo(a)Pyrene		1200	~~U~~ UJ
193-39-5	Indeno(1,2,3-cd)Pyrene		1200	~~U~~ UJ
53-70-3	Dibenz(a,h)Anthracene		1200	~~U~~ UJ
191-24-2	Benzo(g,h,i)Perylene		1200	~~U~~ UJ

(1) - Cannot be separated from Diphenylamine

RS 5/8/95

9613497.1395

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0DMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 22

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0	Aldol Condensation	4.64	25000	~~ABJ~~ U
2.	Aldol Condensation	4.70	2600	~~ABJ~~ U
3.	UNKNOWN	16.77	240	J
4.	UNKNOWN	18.59	2800	J
5.	Unknown Alkane	18.84	1200	J
6.	Unknown Alkane	18.94	320	J
7.	Unknown Alkane	19.44	290	J
8.	UNKNOWN	20.50	390	J
9.	Unknown C12H6Cl4	22.92	220	J
10.	Unknown C12H6Cl4	23.02	340	J
11.	Unknown C12H5Cl5	23.53	1400	J
12.	Unknown C12H5Cl5	24.07	590	J
13.	Unknown C12H4Cl6	24.46	560	J
14.	Unknown C12H4Cl6	24.70	990	J
15.	Unknown C12H5Cl5	24.79	900	J
16.	Unknown C12H4Cl6	25.22	1100	J
17.	Unknown C12H4Cl6	25.75	1200	J
18.	Unknown C12H3Cl7	26.02	500	J
19.	Unknown C12H3Cl7	27.03	650	J
20.	UNKNOWN	28.32	610	J
21.	UNKNOWN	29.60	1000	J
22.	UNKNOWN	29.88	1100	J

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FORM I SV-TIC 1/87 Rev.

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1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	2100	U
111-44-4	bis(2-Chloroethyl)Ether	2100	U
95-57-8	2-Chlorophenol	2100	U
541-73-1	1,3-Dichlorobenzene	2100	U
106-46-7	1,4-Dichlorobenzene	2100	U
95-50-1	1,2-Dichlorobenzene	2100	U
95-48-7	2-Methylphenol	2100	U
108-60-1	2,2'-oxybis(1-Chloropropane)	2100	U
106-44-5	4-Methylphenol	2100	U
621-64-7	N-Nitroso-Di-n-Propylamine	2100	U
67-72-1	Hexachloroethane	2100	U
98-95-3	Nitrobenzene	2100	U
78-59-1	Isophorone	2100	U
88-75-5	2-Nitrophenol	2100	U
105-67-9	2,4-Dimethylphenol	2100	U
111-91-1	bis(2-Chloroethoxy)Methane	2100	U
120-83-2	2,4-Dichlorophenol	2100	U
120-82-1	1,2,4-Trichlorobenzene	2100	U
91-20-3	Naphthalene	2100	U
106-47-8	4-Chloroaniline	4100	U
87-68-3	Hexachlorobutadiene	2100	U
59-50-7	4-Chloro-3-Methylphenol	4100	U
91-57-6	2-Methylnaphthalene	2100	U
77-47-4	Hexachlorocyclopentadiene	2100	U
88-06-2	2,4,6-Trichlorophenol	2100	U
95-95-4	2,4,5-Trichlorophenol	2100	U
91-58-7	2-Chloronaphthalene	2100	U
88-74-4	2-Nitroaniline	10000	U
131-11-3	Dimethyl Phthalate	2100	U
208-96-8	Acenaphthylene	2100	U
606-20-2	2,6-Dinitrotoluene	2100	U

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1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO　　Contract: 550-56

Lab Code: ITMO　　Case No.: S34402　　SAS No.:　　SDG No.: W0429

Matrix: (soil/water) SOIL　　Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G　　Lab File ID: A7718

Level: (low/med) LOW　　Date Received: 01/18/95

% Moisture: not dec. 68 dec.　　Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC　　Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N　　pH:　　Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
99-09-2	3-Nitroaniline	10000	U	
83-32-9	Acenaphthene	2100	U	
51-28-5	2,4-Dinitrophenol	10000	U	
100-02-7	4-Nitrophenol	10000	U	
132-64-9	Dibenzofuran	2100	U	
121-14-2	2,4-Dinitrotoluene	2100	U	
84-66-2	Diethylphthalate	2100	U	
7005-72-3	4-Chlorophenyl-phenylether	2100	U	
86-73-7	Fluorene	2100	U	
100-01-6	4-Nitroaniline	4100	U	
534-52-1	4,6-Dinitro-2-Methylphenol	10000	U	
86-30-6	N-Nitrosodiphenylamine (1)	2100	U	
101-55-3	4-Bromophenyl-phenylether	2100	U	
118-74-1	Hexachlorobenzene	2100	U	
87-86-5	Pentachlorophenol	10000	U	
85-01-8	Phenanthrene	470	J	
120-12-7	Anthracene	460	J	
86-74-8	Carbazole	2100	U	
84-74-2	Di-n-Butylphthalate	2100	U	
206-44-0	Fluoranthene	940	J	
129-00-0	Pyrene	820	J	
85-68-7	Butylbenzylphthalate	2100 ~~1400~~	~~BJ~~	U
91-94-1	3,3'-Dichlorobenzidine	4100	U	
56-55-3	Benzo(a)Anthracene	340	J	
218-01-9	Chrysene	400	J	
117-81-7	bis(2-Ethylhexyl)Phthalate	130	J	
117-84-0	Di-n-Octyl Phthalate	2100	~~U~~	UJ
205-99-2	Benzo(b)Fluoranthene	580	~~J~~	J
207-08-9	Benzo(k)Fluoranthene	220	~~J~~	J
50-32-8	Benzo(a)Pyrene	290	~~J~~	J
193-39-5	Indeno(1,2,3-cd)Pyrene	2100	~~U~~	UJ
53-70-3	Dibenz(a,h)Anthracene	2100	~~U~~	UJ
191-24-2	Benzo(g,h,i)Perylene	2100	~~U~~	UJ

(1) - Cannot be separated from Diphenylamine

RS 5/8/

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 18 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	0	Aldol Condensation	4.65	36000	~~ABJ~~ U
2.		UNKNOWN	16.77	240	J
3.		UNKNOWN	18.59	4600	J
4.		Unknown Alkane	18.85	2100	J
5.		UNKNOWN	18.94	260	J
6.		Unknown Alkane	19.45	230	J
7.		UNKNOWN	20.50	620	J
8.		UNKNOWN	20.97	360	J
9.		UNKNOWN	21.82	230	J
10.		UNKNOWN	26.55	230	J
11.		UNKNOWN	28.12	270	J
12.		UNKNOWN	28.30	280	J
13.		UNKNOWN	29.56	600	J
14.		UNKNOWN	30.48	440	J
15.		UNKNOWN	31.19	360	J
16.		UNKNOWN	31.39	490	J
17.		UNKNOWN	31.75	410	J
18.		UNKNOWN	32.01	700	J

3/7/95 SC

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

B0DMT4

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S44408 SAS No.: SDG No.: W0430

Matrix: (soil/water) SOIL Lab Sample ID: 7444-008

Sample wt/vol: 30.00 (g/mL) G Lab File ID: D6748

Level: (low/med) LOW Date Received: 01/30/95

% Moisture: not dec. 6 dec. Date Extracted: 02/02/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/06/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	700	U
111-44-4	bis(2-Chloroethyl)Ether	700	U
95-57-8	2-Chlorophenol	700	U
541-73-1	1,3-Dichlorobenzene	700	U
106-46-7	1,4-Dichlorobenzene	700	U
95-50-1	1,2-Dichlorobenzene	700	U
95-48-7	2-Methylphenol	700	U
108-60-1	2,2'-oxybis(1-Chloropropane)	700	U
106-44-5	4-Methylphenol	700	U
621-64-7	N-Nitroso-Di-n-Propylamine	700	U
67-72-1	Hexachloroethane	700	U
98-95-3	Nitrobenzene	700	U
78-59-1	Isophorone	700	U
88-75-5	2-Nitrophenol	700	U
105-67-9	2,4-Dimethylphenol	700	U
111-91-1	bis(2-Chloroethoxy)Methane	700	U
120-83-2	2,4-Dichlorophenol	700	U
120-82-1	1,2,4-Trichlorobenzene	700	U
91-20-3	Naphthalene	700	U
106-47-8	4-Chloroaniline	1400	U
87-68-3	Hexachlorobutadiene	700	U
59-50-7	4-Chloro-3-Methylphenol	1400	U
91-57-6	2-Methylnaphthalene	700	U
77-47-4	Hexachlorocyclopentadiene	700	U
88-06-2	2,4,6-Trichlorophenol	700	U
95-95-4	2,4,5-Trichlorophenol	700	U
91-58-7	2-Chloronaphthalene	700	U
88-74-4	2-Nitroaniline	3500	U
131-11-3	Dimethyl Phthalate	700	U
208-96-8	Acenaphthylene	700	U
606-20-2	2,6-Dinitrotoluene	700	U

3/30/95 SC

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SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT4

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S44408 SAS No.: SDG No.: W0430

Matrix: (soil/water) SOIL Lab Sample ID: 7444-008

Sample wt/vol: 30.00 (g/mL) G Lab File ID: D6748

Level: (low/med) LOW Date Received: 01/30/95

% Moisture: not dec. 6 dec. Date Extracted: 02/02/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/06/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	3500	U
83-32-9	Acenaphthene	700	U
51-28-5	2,4-Dinitrophenol	3500	U
100-02-7	4-Nitrophenol	3500	U
132-64-9	Dibenzofuran	700	U
121-14-2	2,4-Dinitrotoluene	700	U
84-66-2	Diethylphthalate	700	U
7005-72-3	4-Chlorophenyl-phenylether	700	U
86-73-7	Fluorene	700	U
100-01-6	4-Nitroaniline	1400	U
534-52-1	4,6-Dinitro-2-Methylphenol	3500	U
86-30-6	N-Nitrosodiphenylamine (1)	700	U
101-55-3	4-Bromophenyl-phenylether	700	U
118-74-1	Hexachlorobenzene	700	U
87-86-5	Pentachlorophenol	3500	U
85-01-8	Phenanthrene	700	U
120-12-7	Anthracene	700	U
86-74-8	Carbazole	700	U
84-74-2	Di-n-Butylphthalate	700	U
206-44-0	Fluoranthene	700	U
129-00-0	Pyrene	700	U
85-68-7	Butylbenzylphthalate	~~700~~ 300	~~B~~ U
91-94-1	3,3'-Dichlorobenzidine	1400	U
56-55-3	Benzo(a)Anthracene	700	U
218-01-9	Chrysene	700	U
117-81-7	bis(2-Ethylhexyl)Phthalate	700	U
117-84-0	Di-n-Octyl Phthalate	700	U
205-99-2	Benzo(b)Fluoranthene	700	U
207-08-9	Benzo(k)Fluoranthene	700	U
50-32-8	Benzo(a)Pyrene	700	U
193-39-5	Indeno(1,2,3-cd)Pyrene	700	U
53-70-3	Dibenz(a,h)Anthracene	700	U
191-24-2	Benzo(g,h,i)Perylene	700	U

(1) - Cannot be separated from Diphenylamine

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3/30/95 SC

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EPA SAMPLE NO

B0DMT4

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S44408 SAS No.: SDG No.: W0430

Matrix: (soil/water) SOIL Lab Sample ID: 7444-008

Sample wt/vol: 30.00 (g/mL) G Lab File ID: D6748

Level: (low/med) LOW Date Received: 01/30/95

% Moisture: not dec. 6 dec. Date Extracted: 02/02/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02/06/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 2 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. 0	Aldol Condensation	5.31	16000	~~ABJ~~ J
2.	UNKNOWN	29.13	77	J

3/30/95 SC

FORM I SV-TIC 1/87 Re

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APPENDIX E

PESTICIDE/PCB DATA SUMMARY TABLES

PESTICIDE/PCB ANALYSIS, SOIL MATRIX, (µg/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: QUANTERRA																					
Case:	SDG: W0429																				
Sample Number		B0DMT2		B0DMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks																					
Sample Date		01/17/95		01/17/95																	
Extraction Date		01/20/95		01/20/95																	
Analysis Date		01/25/95		01/25/95																	
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	1.7	1.8	U	3.1	U																
beta-BHC	1.7	3.5	U	6.2	U																
delta-BHC	1.7	5.3	U	9.3	U																
gamma-BHC (Lindane)	1.7	4.5		4.1	U																
Heptachlor	1.7	1.8	UJ	3.1	UJ																
Aldrin	1.7	8.2	J	36	J																
Heptachlor epoxide	1.7	49	UJ	86	UJ																
Endosulfan I	1.7	8.3	U	14	U																
Dieldrin	3.3	1.2	UJ	2.1	UJ																
4,4'-DDE	3.3	25	UJ	82	UJ																
Endrin	3.3	140	UJ	440	UJ																
Endosulfan II	3.3	45	UJ	55	UJ																
4,4'-DDD	3.3	6.5	U	24	U																
Endosulfan sulfate	3.3	39	UJ	68	UJ																
4,4'-DDT	3.3	170	UJ	190	UJ																
Methoxychlor	17.0	100	UJ	180	UJ																
Endrin Aldehyde	3.3	54	UJ	110	UJ																
Tech. Chlordane	1.7	8.3	U	14	U																
Toxaphene	170.0	140	U	250	U																
Arochlor-1221	33.0	59	U	100	U																
Arochlor-1232	67.0	59	U	100	U																
Arochlor-1242/1016	33.0	39	U	68	U																
Arochlor-1248	33.0	59	U	100	U																
Arochlor-1254	33.0	2300		9800																	
Arochlor-1260	33.0	1800		7500																	

RJS 5/3/95

PESTICIDE/PCB ANALYSIS, SOIL MATRIX, (µg/Kg)

Project: WESTINGHOUSE–HANFORD		
Laboratory: QUANTERRA		
Case:	SDG: W0430	
Sample Number		B0DMT4
Location		Test Pit #2
Remarks		
Sample Date		01/27/95
Extraction Date		02/03/95
Analysis Date		02/08/95

Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha–BHC	1.7	1.1	UJ																		
beta–BHC	1.7	2.1	UJ																		
delta–BHC	1.7	3.2	UJ																		
gamma–BHC (Lindane)	1.7	1.4	U																		
Heptachlor	1.7	1.1	UJ																		
Aldrin	1.7	1.4	U																		
Heptachlor epoxide	1.7	30	U																		
Endosulfan I	1.7	5.0	U																		
Dieldrin	3.3	0.71	U																		
4,4'–DDE	3.3	1.4	UJ																		
Endrin	3.3	2.1	UJ																		
Endosulfan II	3.3	1.4	U																		
4,4'–DDD	3.3	3.9	UJ																		
Endosulfan sulfate	3.3	24	U																		
4,4'–DDT	3.3	4.3	UJ																		
Methoxychlor	17.0	63	UJ																		
Endrin Ketone	3.3	8.2	U																		
Tech. Chlordane	1.7	5.0	U																		
Toxaphene	170.0	85	U																		
Arochlor–1221	33.0	36	UJ																		
Arochlor–1232	67.0	36	U																		
Arochlor–1242/1016	33.0	24	U																		
Arochlor–1248	33.0	36	UJ																		
Arochlor–1254	33.0	36	U																		
Arochlor–1260	33.0	36	U																		

RJS 5/3/95

9613497.1404

000071

APPENDIX F

PESTICIDE/PCB VALIDATED LABORATORY REPORT FORMS

9613497.1406

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
BODMT2

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: ______ SAS No.: ______ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.0 (g/ml) g Lab File ID: ______

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 44 dec. ______ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01-25-95

GPC Cleanup: (Y/N) N pH: ______ Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q	
319-84-6	alpha-BHC	1.8	U	
319-85-7	beta-BHC	3.5	U	
319-86-8	delta-BHC	5.3	U	
58-89-9	gamma-BHC (Lindane)	4.5		
76-44-8	Heptachlor	1.8	~~U~~	UJ
309-00-2	Aldrin	8.2	~~/~~	UJ
1024-57-3	Heptachlor epoxide	49	~~U~~	UJ
959-98-8	Endosulfan I	8.3	U	
60-57-1	Dieldrin	1.2	~~U~~	UJ
72-55-9	4,4'-DDE	25	~~UX~~	UJ
72-20-8	Endrin	140	~~UX~~	UJ
33213-65-9	Endosulfan II	45	~~UX~~	UJ
72-54-8	4,4'-DDD	6.5	U	
1031-07-8	Endosulfan sulfate	39	~~U~~	UJ
50-29-3	4,4'-DDT	170	~~UX~~	UJ
72-43-5	Methoxychlor	100	~~U~~	UJ
53494-70-5	Endrin Aldehyde	54	~~UX~~	UJ
57-74-9	Tech. Chlordane	8.3	U	
8001-35-2	Toxaphene	140	U	
11104-28-2	Aroclor-1221	59	U	
11141-28-2	Aroclor-1232	59	U	
53469-21-9/12674-11-2	Aroclor-1242/1016	39	U	
12672-29-6	Aroclor-1248	59	U	
11097-57-4	Aroclor-1254		SD	
11096-82-5	Aroclor-1260		SD	

RS 4/30/95

U: Concentration of analyte is less than the value given.
SD: See dilution
X: Elevated detection limit due to PCB interference.

FORM I PEST

1/87 Rev.

9613497.1407

1D

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

BODMT2DL

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002DL

Sample wt/vol: 30.0 (g/ml) g Lab File ID: _____

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 44 dec. _____ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02-02-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 10

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
11104-28-2	Aroclor-1221	590	U
11141-28-2	Aroclor-1232	590	U
53469-21-9/12674-11-2	Aroclor-1242/1016	390	U
12672-29-6	Aroclor-1248	590	U
11097-57-4	Aroclor-1254	2300	
11096-82-5	Aroclor-1260	1800	

U: Concentration of analyte is less than the value given.

RS 4/30/95

9613497.1408 1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT3

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.0 (g/ml) g Lab File ID: .

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 68 dec. _____ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01-25-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q	
319-84-6	alpha-BHC	3.1	U	
319-85-7	beta-BHC	6.2	U	
319-86-8	delta-BHC	9.3	U	
58-89-9	gamma-BHC (Lindane)	4.1	U	
76-44-8	Heptachlor	3.1	U	UJ
309-00-2	Aldrin	36		JJ
1024-57-3	Heptachlor epoxide	86	U	UJ
959-98-8	Endosulfan I	14	U	
60-57-1	Dieldrin	2.1	U	UJ
72-55-9	4,4'-DDE	82	UX	UJ
72-20-8	Endrin	440	UX	UJ
33213-65-9	Endosulfan II	55	UX	
72-54-8	4,4'-DDD	24	UX	
1031-07-8	Endosulfan sulfate	68	U	UJ
50-29-3	4,4'-DDT	190	UX	UJ
72-43-5	Methoxychlor	180	U	UJ
53494-70-5	Endrin Aldehyde	110	UX	UJ
57-74-9	Tech. Chlordane	14	U	
8001-35-2	Toxaphene	250	U	
11104-28-2	Aroclor-1221	100	U	
11141-28-2	Aroclor-1232	100	U	
53469-21-9/12674-11-2	Aroclor-1242/1016	68	U	
12672-29-6	Aroclor-1248	100	U	
11097-57-4	Aroclor-1254		SD	
11096-82-5	Aroclor-1260		SD	

U: Concentration of analyte is less than the value given.
SD: See dilution
X: Elevated detection limit due to PCB interference.

RS 4/30/95

FORM I PEST 1/87 Rev.

0070

9613497.1409

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT3DL

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004DL

Sample wt/vol: 30.0 (g/ml) g Lab File ID: _____

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 68 dec. _____ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01-24-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 25

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
319-84-6	alpha-BHC	77	U
319-85-7	beta-BHC	150	U
319-86-8	delta-BHC	230	U
58-89-9	gamma-BHC (Lindane)	100	U
76-44-8	Heptachlor	77	U
309-00-2	Aldrin	100	U
1024-57-3	Heptachlor epoxide	2100	U
959-98-8	Endosulfan I	360	U
60-57-1	Dieldrin	52	U
72-55-9	4,4'-DDE	100	U
72-20-8	Endrin	780	UX
33213-65-9	Endosulfan II	100	U
72-54-8	4,4'-DDD	280	U
1031-07-8	Endosulfan sulfate	1700	U
50-29-3	4,4'-DDT	340	UX
72-43-5	Methoxychlor	4500	U
53494-70-5	Endrin Aldehyde	590	U
57-74-9	Tech. Chlordane	360	U
8001-35-2	Toxaphene	6200	U
11104-28-2	Aroclor-1221	2600	U
11141-28-2	Aroclor-1232	2600	U
53469-21-9/12674-11-2	Aroclor-1242/1016	1700	U
12672-29-6	Aroclor-1248	2600	U
11097-57-4	Aroclor-1254	9800	
11096-82-5	Aroclor-1260	7500	

U: Concentration of analyte is less than the value given.
X: Elevated detection limit is due to PCB interference.

RS 4/30/95

FORM I PEST 1/87 Rev.

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9613497.1410

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT4

Lab Name: QUANTERRA,MO Contract: 550-56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0430

Matrix: (soil/water) SOIL Lab Sample ID: 7444-008

Sample wt/vol: 30.0 (g/ml) g Lab File ID: _____

Level: (low/med) LOW Date Sampled: 01-27-95

% Moisture: not dec. 6 dec. _____ Date Extracted: 02-03-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02-08-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
319-84-6	alpha-BHC	1.1	U	UJ
319-85-7	beta-BHC	2.1	U	UJ
319-86-8	delta-BHC	3.2	U	UJ
58-89-9	gamma-BHC (Lindane)	1.4	U	
76-44-8	Heptachlor	1.1	U	UJ
309-00-2	Aldrin	1.4	U	
1024-57-3	Heptachlor epoxide	30	U	
959-98-8	Endosulfan I	5.0	U	
60-57-1	Dieldrin	0.71	U	
72-55-9	4,4'-DDE	1.4	U	UJ
72-20-8	Endrin	2.1	U	UJ
33213-65-9	Endosulfan II	1.4	U	
72-54-8	4,4'-DDD	3.9	U	UJ
1031-07-8	Endosulfan sulfate	24	U	
50-29-3	4,4'-DDT	4.3	U	UJ
72-43-5	Methoxychlor	63	U	UJ
7421-93-4	Endrin Aldehyde	8.2	U	
57-74-9	Chlordane (technical)	5.0	U	
8001-35-2	Toxaphene	85	U	
11104-28-2	Aroclor-1221	36	U	UJ
11141-16-5	Aroclor-1232	36	U	
53469-21-9/12674-11-2	Arochlor-1242/1016	24	U	
12672-29-6	Aroclor-1248	36	U	UJ
11097-69-1	Aroclor-1254	36	U	
11096-82-5	Aroclor-1260	36	U	

U: Concentration of analyte is less than the value given.

4/22/95

FORM I PEST

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APPENDIX G

METALS DATA SUMMARY TABLES

INORGANIC ANALYSIS, SOIL MATRIX, (mg/kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Quanterra																					
Case	SDG: W0429																				
Sample Number		B0DMT2		B0DMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks	MG/KG	Soil		Soil																	
Sample Date		01/17/95		01/17/95																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	20	53700		63400																	
Antimony	10	7.8		10.1	U																
Arsenic	1	14.4		41.1																	
Barium	20	74.3		107																	
Beryllium	0.7	0.59		0.76																	
Cadmium	2	2.6		4.7																	
Calcium	500	3630		4200																	
Chromium	2	66.4		77.1																	
Cobalt	5	7.3		9.4																	
Copper	2.5	68.6		55.8																	
Iron	10	20100		21000																	
Lead	0.3	104		197																	
Magnesium	500	3090		4180																	
Manganese	1.5	140		201																	
Nickel	4	14.7		18.8																	
Potassium	500	654		970																	
Selenium	0.5	0.18	U	0.31	U																
Silver	20	0.76		1.3																	
Sodium	100	244		286																	
Thallium	1	0.28		0.32																	
Vanadium	5	45.0		46.5																	
Zinc	2	450		1030																	

RJS 5/3/95

FIL = Filtered, NA = Not Analyzed, N/A = Not Applicable

INORGANIC ANALYSIS, SOIL MATRIX, (mg/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Quanterra																					
Case	SDG: W0430																				
Sample Number		B0DMT4																			
Location		Test Pit #2																			
Remarks	MG/KG	Soil																			
Sample Date		01/27/95																			
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	20	4010																			
Antimony	10	6.3	BJ																		
Arsenic	1	0.68																			
Barium	20	93.5																			
Beryllium	0.7	0.45	BJ																		
Cadmium	2	0.41	U																		
Calcium	500	4020																			
Chromium	2	4.9																			
Cobalt	5	13.0																			
Copper	2.5	14.5																			
Iron	10	13400																			
Lead	0.3	1.7																			
Magnesium	500	4060																			
Manganese	1.5	311	J																		
Nickel	4	7.1																			
Potassium	500	477																			
Selenium	0.5	0.11	U																		
Silver	20	0.41	U																		
Sodium	100	129																			
Thallium	1	0.1	UJ																		
Vanadium	5	68.7																			
Zinc	2	56.2																			

RS 5/5/95

FIL = Filtered, NA = Not Analyzed, N/A = Not Applicable

APPENDIX H

METALS VALIDATED LABORATORY REPORT FORMS

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0DMT2

Name: ITAS_ST._LOUIS Contract: 550.56

Code: ITMO Case No.: SAS No.: SDG No.: W0429

rix (soil/water): SOIL Lab Sample ID: 7344-002

el (low/med): LOW Date Received: 01/18/95

olids: 56.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	53700			P
7440-36-0	Antimony	7.8	B		P
7440-38-2	Arsenic	14.4	B		F
7440-39-3	Barium	74.3			P
7440-41-7	Beryllium	0.59	B		P
7440-43-9	Cadmium	2.6	B		P
7440-70-2	Calcium	3630			P
7440-47-3	Chromium	66.4			P
7440-48-4	Cobalt	7.3	B		P
7440-50-8	Copper	68.6			P
7439-89-6	Iron	20100			P
7439-92-1	Lead	104			P
7439-95-4	Magnesium	3090			P
7439-96-5	Manganese	140			P
7440-02-0	Nickel	14.7			P
7440-09-7	Potassium	654	B		P
7782-49-2	Selenium	0.18	U		F
7440-22-4	Silver	0.76	B		P
7440-23-5	Sodium	244			P
7440-28-0	Thallium	0.28	B		F
7440-62-2	Vanadium	45.0			P
7440-66-6	Zinc	450			P

lor Before: Clarity Before: Texture:

lor After: Clarity After: Artifacts:

mments:

4/24/95

FORM I - IN

RJS SW-846

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000082

9613497.1416

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0DMT4

Lab Name: QUANTERRA_MO Contract: 550.56

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0430

Matrix (soil/water): SOIL Lab Sample ID: 7444-008

Level (low/med): LOW Date Received: 01/30/95

% Solids: 93.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4010			P	
7440-36-0	Antimony	6.3	B		P	BJ
7440-38-2	Arsenic	0.68	B		F	
7440-39-3	Barium	93.5			P	
7440-41-7	Beryllium	0.45	B		P	BJ
7440-43-9	Cadmium	0.41	U		P	
7440-70-2	Calcium	4020			P	
7440-47-3	Chromium	4.9			P	
7440-48-4	Cobalt	13.0			P	
7440-50-8	Copper	14.5			P	
7439-89-6	Iron	13400			P	
7439-92-1	Lead	1.7			F	
7439-95-4	Magnesium	4060			P	
7439-96-5	Manganese	311			P	J
7440-02-0	Nickel	7.1			P	
7440-09-7	Potassium	477	B		P	
7782-49-2	Selenium	0.11	U		F	
7440-22-4	Silver	0.41	U		P	
7440-23-5	Sodium	129			P	
7440-28-0	Thallium	0.10	U		F	UJ
7440-62-2	Vanadium	68.7			P	
7440-66-6	Zinc	56.2			P	

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

RJS 4/24/95

FORM I - IN

SW-846

0000735 RS

APPENDIX I

GENERAL CHEMISTRY DATA SUMMARY TABLES

WET CHEMISTRY/ANIONS ANALYSIS, SOIL MATRIX, (ug/g)

Project: WESTINGHOUSE–HANFORD																					
Laboratory: QUANTERRA																					
Case	SDG: W0429																				
Sample Number		B0DMT2		B0DMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks	UG/G	Soil		Soil																	
Sample Date		01/17/95		01/17/95																	
Wet Chemistry Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Fluoride	300.0	1.70	U	6.25																	
Sulfate	300.0	2230		4040																	
Chloride	300.0	15.4		20.3																	
Sulfide	9030	21.0		44.7																	
Nitrate	300.0	69.5		50.3																	
Nitrite	300.0	0.34	U	0.61	U																
Phosphate	300.0	17.0	U	30.6	U																
Nitrate/Nitrite	353.1	53.4		35.4																	
TOX	9020	86.8	U	150	U																

RBC for RJS
5/3/95

EB = Equipment Blank

WET CHEMISTRY/ANIONS ANALYSIS, WATER MATRIX, (mg/L)

Project: WESTINGHOUSE–HANFORD																					
Laboratory: QUANTERRA																					
Case	SDG: W0430																				
Sample Number		B0DMT4																			
Location		Test Pit #2																			
Remarks	UG/G	Soil																			
Sample Date		01/27/95																			
Wet Chemistry Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Fluoride	300.0	0.96	U																		
Sulfate	300.0	54.1																			
Chloride	300.0	2.40	U																		
Sulfide	9030	11.8																			
Nitrate	300.0	1.03																			
Nitrite	300.0	0.19	U																		
Phosphate	300.0	9.60	U																		
Nitrate/Nitrite	353.1	1.00																			
TOX	9020	49.3	U																		

280000

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RKC for RJT
5/3/95

EB = Equipment Blank

APPENDIX J

GENERAL CHEMISTRY VALIDATED LABORATORY REPORT FORMS

9613497.1421

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra
Environmental Services

Project: 550.56

Category: Nitrate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001DUP	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001MS	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	106	%REC			1
BODMT2	7344-002	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	69.5	UG/G		1.70	5
BODMT3	7344-004	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	50.3	UG/G		1.22	2
NA	QCBLK57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
NA	QCLCS57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	100	%REC			1

RBC for RJS
4/7/95

9613497.1422

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Nitrite
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001DUP	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
BODMT6	7344-001MS	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	103	%REC			5
BODMT2	7344-002	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.34	UG/G	U	0.34	1
BODMT3	7344-004	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.61	UG/G	U	0.61	1
NA	QCBLK57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
NA	QCLCS57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	104	%REC			1

RDC for RJS
4/7/95

RDC 4/7/95

9613497.1423

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra Environmental Services

Project: 550.56

Category: Orthophosphate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.86	UG/G	U	9.86	1
BODMT6	7344-001DUP	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.84	UG/G	U	9.84	1
BODMT6	7344-001MS	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	102	%REC			1
BODMT2	7344-002	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	17.0	UG/G	U	17.0	1
BODMT3	7344-004	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	30.6	UG/G	U	30.6	1
NA	QCBLK57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	10.0	UG/G	U	10.0	1
NA	QCLCS57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	96	%REC			1

RBC
for RJS
4/7/95

9613497.1424

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Chloride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.96	UG/G		2.47	1
BODMT6	7344-001DUP	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.96	UG/G		2.46	1
BODMT6	7344-001MS	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	102	%REC			5
BODMT2	7344-002	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	15.4	UG/G		4.25	1
BODMT3	7344-004	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	20.3	UG/G		7.66	1
NA	QCBLK57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.50	UG/G	U	2.50	1
NA	QCLCS57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	94	%REC			1

RJS 4/7/95

9613497.1425

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra Environmental Services

Project: 550.56

Category: Fluoride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	0.99	UG/G	U	0.99	1
BODMT6	7344-001DUP	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	0.98	UG/G	U	0.98	1
BODMT6	7344-001MS	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	107	%REC			1
BODMT2	7344-002	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	1.70	UG/G	U	1.70	1
BODMT3	7344-004	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	6.25	UG/G		3.06	1
NA	QCBLK57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	1.00	UG/G	U	1.00	1
NA	QCLCS57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	103	%REC			1

RDC for RJS
4/7/95

000093

9613497.1426

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Sulfate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	9.86	UG/G	U	9.86	1
BODMT6	7344-001DUP	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	9.84	UG/G	U	9.84	1
BODMT6	7344-001MS	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	101	%REC			5
BODMT2	7344-002	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	2230	UG/G		170	10
BODMT3	7344-004	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	4040	UG/G		306	10
NA	QCBLK57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	10.0	UG/G	U	10.0	1
NA	QCLCS57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	97	%REC			1

RBC for RJS

4/1/95

9613497.1427

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: TOX
Method: EPA 9020
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil
B0DMT6	7344-001	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	47.1	UG/G	U	47.1	1
B0DMT6	7344-001DUP	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	46.1	UG/G	U	46.1	1
B0DMT6	7344-001MS	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	101	%REC			1
B0DMT2	7344-002	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	86.8	UG/G	U	86.8	1
B0DMT3	7344-004	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	150	UG/G	U	150	1
NA	QCBLK58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	50.0	UG/G	U	50.0	1
NA	QCLCS58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	99	%REC			1

RJS 4/1/95

000095

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra Environmental Services

Project: 550.56

Category: Sulfide
Method: EPA 9030
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.8	UG/G		10.6	1
BODMT6	7344-001DUP	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.6	UG/G	U	10.6	1
BODMT6	7344-001MS	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	78	%REC			1
BODMT2	7344-002	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	21.0	UG/G		19.0	1
BODMT3	7344-004	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	44.7	UG/G		34.0	1
NA	QCBLK57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.6	UG/G	U	10.6	1
NA	QCLCS57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	84	%REC			1

RJS
4/7/95

9613497.1429

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: NO2-NO3
Method: EPA 353.1
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.48	UG/G	U	0.48	1
BODMT6	7344-001DUP	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	U	0.50	1
BODMT6	7344-001MS	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	104	%REC			1
BODMT2	7344-002	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	53.4	UG/G		4.40	5
BODMT3	7344-004	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	35.4	UG/G		3.09	2
MA	QCBLK57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	U	0.50	1
MA	QCLCS57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	92	%REC			1

RBC for RJS 4/7/95

CLIENT

9613497.1430

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Nitrate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0DMS4	7444-001	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	5.42	UG/G		0.21	1
30DMS4	7444-001DUP	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	5.34	UG/G		0.21	1
30DMS4	7444-001MS	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	93	%REC			1
B0DMT4	7444-008	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	1.03	UG/G		0.19	1
NA	QCBLK58660-1	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	0.20	UG/G	U	0.20	1
NA	QCLCS58660-1	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	98	%REC			1

RLC for RJS 4/14/95

000098

000094

9613497.1431

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Nitrite
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.21	UG/G	U	0.21	1
BODMS4	7444-001DUP	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.21	UG/G	U	0.21	1
BODMS4	7444-001MS	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	103	%REC			5
BODMT4	7444-008	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.19	UG/G	U	0.19	1
NA	QCBLK58660-1	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.20	UG/G	U	0.20	1
NA	QCLCS58660-1	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	98	%REC			1

RJC for RJS

9613497.1432

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Orthophosphate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
B0DMS4	7444-001	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.4	UG/G	U	10.4	1
30DMS4	7444-001DUP	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.3	UG/G	U	10.3	1
30DMS4	7444-001MS	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	104	%REC			1
B0DMT4	7444-008	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	9.60	UG/G	U	9.60	1
NA	QCBLK58660-1	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.0	UG/G	U	10.0	1
NA	QCLCS58660-1	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	93	%REC			1

RBC for RJS 4/11/95

000106

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9613497.1433

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Chloride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.59	UG/G	U	2.59	1
BODMS4	7444-001DUP	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.58	UG/G	U	2.58	1
BODMS4	7444-001MS	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	100	%REC			5
BODMT4	7444-008	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.40	UG/G	U	2.40	1
NA	QCBLK58660-1	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.50	UG/G	U	2.50	1
NA	QCLCS58660-1	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	90	%REC			1

RBC
for
JRS
4/11/95

9613497.1434

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Fluoride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
30DMS4	7444-001	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.04	UG/G	U	1.04	1
30DMS4	7444-001DUP	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.03	UG/G	U	1.03	1
30DMS4	7444-001MS	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	112	%REC			1
30DMT4	7444-008	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	0.96	UG/G	U	0.96	1
NA	QCBLK58660-1	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.00	UG/G	U	1.00	1
IA	QCLCS58660-1	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	103	%REC			1

RJC
for
RJS
4/11/95

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9613497.1435

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Sulfate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	25.1	UG/G		10.4	1
BODMS4	7444-001DUP	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	24.7	UG/G		10.3	1
BODMS4	7444-001MS	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	95	%REC			5
BODMT4	7444-008	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	54.1	UG/G		9.60	1
NA	QCBLK58660-1	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	10.0	UG/G	U	10.0	1
NA	QCLCS58660-1	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	92	%REC			1

RBC for RJS

DECC95

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Sulfide
Method: EPA 9030
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.1	UG/G	U	11.1	1
BODMS4	7444-001DUP	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.0	UG/G	U	11.0	1
BODMS4	7444-001MS	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	107	%REC			1
BODMT4	7444-008	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.8	UG/G		11.4	1
NA	QCBLK58516-1	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	10.6	UG/G	U	10.6	1
NA	QCLCS58516-1	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	105	%REC			1

RJO 4/11/95

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: NO2-NO3
Method: EPA 353.1
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil
BODMS4	7444-001	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	4.73	UG/G		0.51	1
BODMS4	7444-001DUP	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	4.75	UG/G		0.51	1
BODMS4	7444-001MS	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	80	%REC			1
BODMT4	7444-008	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	1.00	UG/G		0.53	1
NA	QCBLK59558-1	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	0.50	UG/G	U	0.50	1
NA	QCLCS59558-1	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	107	%REC			1

RBC
RW
RWS
4/11/95

9613497.1438

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: TOX
Method: EPA 9020
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/09/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Di
BODMS4	7444-001	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	47.7	UG/G	U	47.7	
BODMS4	7444-001DUP	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	48.1	UG/G	U	48.1	
BODMS4	7444-001MS	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	95	%REC			
BODMT4	7444-008	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	49.3	UG/G	U	49.3	
NA	QCBLK58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	50.0	UG/G	U	50.0	
NA	QCLCS58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	99	%REC			

RBC for RJS

APPENDIX K

RADIOCHEMISTRY DATA SUMMARY TABLES

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (pCi/g+−2 standard deviations)

Project: WESTINGHOUSE−HANFORD																					
Laboratory: QES																					
Case	SDG: W0429																				
Sample Number		B0DMT2		BODMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks	pCi/g	Soil		Soil																	
Sample Date		01/17/95		01/17/95																	
Radiochemistry Analysis		Result	Q		Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha		9.95		25.0																	
Gross Beta		20.6		21.1																	
Cobalt−58		0.0165	U	0.0143	U																
Cobalt−60		0.929		2.43																	
Cesium−137DA		2.72		3.09																	
Europium−152		1.55		1.96																	
Europium−154		0.331		0.46																	
Europium−155		0.0790	U	0.112	U																
Iron−59		−0.0454	U	−0.0669	U																
Potassium−40		9.57		6.77																	
Radium−224DA		0.863		1.05																	
Radium−226DA		0.813		0.801																	
Radium−228DA		0.721	J	1.51	J																
Uranium−238DLP		2.76	J	5.90	J																

RJS 5/3/95

Project: WESTINGHOUSE-HANFORD
Laboratory: QES
Case | SDG: WO430

Sample Number	B0DMT4																			
Location	100-D																			
Remarks pCi/g	Soil																			
Sample Date	01/27/95																			
Radiochemistry Analysis	Result	Q		Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	1.90	U																		
Gross Beta	15.9																			
Cobalt-58	0.00435	U																		
Cobalt-60	0.0119	U																		
Cesium-137DA	0.0254																			
Europium-152	0.0186	U																		
Europium-154	-0.0058	U																		
Europium-155	0.0301	U																		
Iron-59	-0.0477	U																		
Potassium-40	9.42																			
Radium-224DA	0.414																			
Radium-226DA	0.367																			
Radium-228DA	0.442																			

RJS 5/3/95

9613497.1141

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APPENDIX L

RADIOCHEMISTRY VALIDATED LABORATORY REPORT FORMS

Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	**SDG:**	W0429
LAB SAMPLE ID:	50132303	**MATRIX:**	SOIL
CLIENT ID:	B0DMT2	**DATE RECEIVED:**	1/18/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
CO-58	1.65E-02 U	2.6E-02	2.6E-02	4.42E-02	pCi/g	N/A	RD3219
CO-60	9.29E-01	6.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219
CS-137DA	2.72E+00	7.0E-02	2.8E-01	N/A	pCi/g	N/A	RD3219
EU-152	1.55E+00	1.2E-01	1.9E-01	N/A	pCi/g	N/A	RD3219
EU-154	3.31E-01	6.6E-02	7.4E-02	1.36E-01	pCi/g	N/A	RD3219
EU-155	7.90E-02 U	5.9E-02	6.0E-02	8.92E-02	pCi/g	N/A	RD3219
FE-59	-4.54E-02 U	6.8E-02	6.8E-02	1.07E-01	pCi/g	N/A	RD3219
K-40	9.57E+00	5.7E-01	1.1E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	8.63E-01	4.5E-02	9.7E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	8.13E-01	7.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219
RA-228DA	7.21E-01 J	1.3E-01	1.5E-01	N/A	pCi/g	N/A	RD3219
U-238DLP	2.76E+00 J	1.2E+00	1.2E+00	N/A	pCi/g	N/A	RD3219
ALPHA	9.95E+00	4.8E+00	4.9E+00	5.93E+00	pCi/g	100.00%	RD3222
BETA	2.06E+01	3.3E+00	3.6E+00	3.58E+00	pCi/g	100.00%	RD3222

Number of Results: 14

RBC 4-18-95

~~GOOGRBC~~

Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	**SDG:**	W0429
LAB SAMPLE ID:	50132305	**MATRIX:**	SOIL
CLIENT ID:	B0DMT3	**DATE RECEIVED:**	1/18/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
CO-58	1.43E-02 U	4.2E-02	4.2E-02	7.22E-02	pCi/g	N/A	RD3219
CO-60	2.43E+00	1.0E-01	2.6E-01	N/A	pCi/g	N/A	RD3219
CS-137DA	3.09E+00	1.0E-01	3.3E-01	N/A	pCi/g	N/A	RD3219
EU-152	1.96E+00	1.7E-01	2.6E-01	N/A	pCi/g	N/A	RD3219
EU-154	4.60E-01	1.0E-01	1.1E-01	2.01E-01	pCi/g	N/A	RD3219
EU-155	1.12E-01 U	7.6E-02	7.6E-02	1.29E-01	pCi/g	N/A	RD3219
FE-59	-6.69E-02 U	1.1E-01	1.1E-01	1.78E-01	pCi/g	N/A	RD3219
K-40	6.77E+00	7.3E-01	9.9E-01	N/A	pCi/g	N/A	RD3219
RA-224DA	1.05E+00	8.0E-02	1.3E-01	N/A	pCi/g	N/A	RD3219
RA-226DA	8.01E-01	1.1E-01	1.3E-01	N/A	pCi/g	N/A	RD3219
RA-228DA	1.51E+00 J	2.5E-01	2.9E-01	N/A	pCi/g	N/A	RD3219
U-238DLP	5.90E+00 J	1.8E+00	1.9E+00	N/A	pCi/g	N/A	RD3219
ALPHA	2.50E+01	7.0E+00	7.5E+00	5.34E+00	pCi/g	100.00%	RD3222
BETA	2.11E+01	3.3E+00	3.6E+00	3.66E+00	pCi/g	100.00%	RD3222

Number of Results: 14

RLC 4-18-95

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Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	**SDG:**	W0430
LAB SAMPLE ID:	50151812	**MATRIX:**	SOIL
CLIENT ID:	B0DMT4	**DATE RECEIVED:**	1/30/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
CO-58	4.35E-03 U	1.2E-02	1.2E-02	2.06E-02	pCi/g	N/A	RD3219
CO-60	1.19E-02 U	1.0E-02	1.0E-02	1.90E-02	pCi/g	N/A	RD3219
CS-137DA	2.54E-02	1.4E-02	1.4E-02	N/A	pCi/g	N/A	RD3219
EU-152	1.86E-02 U	2.6E-02	2.6E-02	4.23E-02	pCi/g	N/A	RD3219
EU-154	-5.84E-03 U	3.1E-02	3.1E-02	5.33E-02	pCi/g	N/A	RD3219
EU-155	3.01E-02 U	2.2E-02	2.3E-02	3.84E-02	pCi/g	N/A	RD3219
FE-59	-4.77E-02 U	3.3E-02	3.4E-02	5.04E-02	pCi/g	N/A	RD3219
K-40	9.42E+00	4.3E-01	1.0E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	4.14E-01	2.8E-02	5.0E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	3.67E-01	4.0E-02	5.5E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	4.42E-01	6.7E-02	8.0E-02	N/A	pCi/g	N/A	RD3219
ALPHA	1.90E+00 U	2.7E+00	2.7E+00	5.34E+00	pCi/g	100.00%	RD3222
BETA	1.59E+01	3.0E+00	3.2E+00	3.66E+00	pCi/g	100.00%	RD3222

Number of Results: 13

RBC
30-3-95

~~A006~~ RBC

DON'T SAY IT - - WRITE IT!

Date:

From: P. K. Reich H4-14, (509) 372-2785

Subject: Correction of Validation Date Received Stamp

The Date Stamped on this Validation Report is the date the final correction documents were received in the completion of the Validation Review Process.

The original front page(s) are maintained as a documented record of the date the Validation Report was originally received from the Validators.

Thank You,

Pat Reich
Data Management

RECORD COPY

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Inorganics - Data Package No. W0429-QES (SDG No. W0429)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-QES prepared by Quanterra Environmental Services (QTES). 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 Level	Analysis
B0DMT2	01/17/95	Soil	D	See Note 1
B0DMT3	01/17/95	Soil	D	See Note 1

Note 1. Requested Method: CLP-ICP Metals/AA Metals

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualifications
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 ICP metals and GFAA metals analyses were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be analyzed within six months for all metals.

  Holding time requirements for all analytes were met.

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Wet Chemistry - Data Package No. W0429-QES (SDG No. W0429)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-QES prepared by Quanterra Environmental Services (QTES). 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 Level	Analysis
B0DMT2	01/17/95	Soil	D	See Note 1
B0DMT3	01/17/95	Soil	D	See Note 1

Note 1. Requested Method: Fluoride, Sulfate, Chloride, Sulfide, Nitrate, Nitrite, Phosphate, Nitrate/Nitrite and TOX

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualifications
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 fluoride, sulfate, chloride, sulfide, nitrate, nitrite, phosphate, nitrate/nitrite and TOX were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: 28 days for chloride, fluoride, sulfate, TOX and

nitrate/nitrite; seven days for sulfide; and two days for nitrate, nitrite and phosphate.

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

Holding times for all analytes met QC requirements.

- **Blanks**

One laboratory preparation blank is analyzed with each sample batch. At least one initial calibration blank is analyzed for every 20 samples. As per WHC guidelines, no qualification of data was necessary.

- **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 a range of 75% to 125%. Samples with a spike recovery <30% and a sample value below the IDL are rejected and flagged "UR". Samples with a spike recovery between 30% to 74% and a sample value below the IDL are qualified as estimates and flagged "UJ". Samples with a spike recovery of <75% or >125% and a sample value >IDL are qualified as "J". Finally, samples with a spike recovery >125% and a sample value <IDL are acceptable and do not require qualification.

All matrix spike results were acceptable.

Laboratory Control Sample Recovery

The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be prepared (e.g., digested or distilled) and analyzed with every group of samples which have been prepared together. The performance criteria for aqueous LCS percent recovery is 80% to 120%. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

All LCS results were acceptable.

- **Precision**

  Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Samples whose precision results fell outside the quality control limits were qualified as estimates and flagged "J".

  All duplicate analyses results were acceptable.

- **Sample Result Verification and Detection Limits**

  Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

  All sample results and reported detection limits were acceptable.

- **Completeness**

  Data Package No. W0429-QES (SDG No. W0429) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found

REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1988c, *EPA Contract Laboratory Program Statement of Work for Inorganics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1988d, *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1990, *EPA Contract Laboratory Program Statement of Work for Inorganic Analyses, Multi-media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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 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: W0429	REVIEWER: RJS	DATE: 4/7/95	PAGE 1 OF 1
COMMENTS: No quaification required			
COMPOUND	QUALIFIERS	SAMPLES AFFECTED	REASON

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

WET CHEMISTRY/ANIONS ANALYSIS, SOIL MATRIX, (ug/g)

Project: WESTINGHOUSE–HANFORD																					
Laboratory: QUANTERRA																					
Case	SDG: W0429																				
Sample Number		B0DMT2		B0DMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks	UG/G	Soil		Soil																	
Sample Date		01/17/95		01/17/95																	
Wet Chemistry Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Fluoride	300.0	1.70	U	6.25																	
Sulfate	300.0	2230		4040																	
Chloride	300.0	15.4		20.3																	
Sulfide	9030	21.0		44.7																	
Nitrate	300.0	69.5		50.3																	
Nitrite	300.0	0.34	U	0.61	U																
Phosphate	300.0	17.0	U	30.6	U																
Nitrate/Nitrite	353.1	53.4		35.4																	
TOX	9020	86.6	U	150	U																

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9613497.1457

RJS 5/9/95

EB = Equipment Blank

9613497.1458

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra
Environmental Services

Project: 550.56

ategory: Nitrate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

ient ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
DMT6	7344-001	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
DMT6	7344-001DUP	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
DMT6	7344-001MS	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	106	%REC			1
DMT2	7344-002	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	69.5	UG/G		1.70	5
DMT3	7344-004	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	50.3	UG/G		1.22	2
\	QCBLK57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
\	QCLCS57444-2	Nitrate	14797-55-8	QCBLK57444-2	01/20/95	01/20/95	100	%REC			1

RJS 5/9/95

BC

9613497.1459

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Nitrite
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

ient ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
DMT6	7344-001	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
DMT6	7344-001DUP	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
DMT6	7344-001MS	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	103	%REC			5
DMT2	7344-002	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.34	UG/G	U	0.34	1
DMT3	7344-004	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.61	UG/G	U	0.61	1
	QCBLK57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	0.20	UG/G	U	0.20	1
	QCLCS57444-2	Nitrite	7632-00-0	QCBLK57444-2	01/20/95	01/20/95	104	%REC			1

RJS 3/9/95

9613497.1460

Quanterra
Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Orthophosphate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

ient ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
DMT6	7344-001	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.86	UG/G	U	9.86	1
DMT6	7344-001DUP	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	9.84	UG/G	U	9.84	1
DMT6	7344-001MS	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	102	%REC			1
DMT2	7344-002	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	17.0	UG/G	U	17.0	1
DMT3	7344-004	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	30.6	UG/G	U	30.6	1
	QCBLK57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	10.0	UG/G	U	10.0	1
	QCLCS57444-2	Ortho-Phosphate	7778-77-0	QCBLK57444-2	01/20/95	01/20/95	96	%REC			1

RJS
5/9/95

Quanterra
Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Chloride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.96	UG/G		2.47	1
BODMT6	7344-001DUP	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.96	UG/G		2.46	1
BODMT6	7344-001MS	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	102	%REC			5
BODMT2	7344-002	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	15.4	UG/G		4.25	1
BODMT3	7344-004	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	20.3	UG/G		7.66	1
NA	QCBLK57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	2.50	UG/G	U	2.50	1
NA	QCLCS57444-2	Chloride	16887-00-6	QCBLK57444-2	01/20/95	01/20/95	94	%REC			1

RJS 4/7/95

9613497.1462

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra Environmental Services

Project: 550.56

Category: Fluoride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	0.99	UG/G	U	0.99	1
BODMT6	7344-001DUP	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	0.98	UG/G	U	0.98	1
BODMT6	7344-001MS	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	107	%REC			1
BODMT2	7344-002	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	1.70	UG/G	U	1.70	1
BODMT3	7344-004	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	6.25	UG/G		3.06	1
NA	QCBLK57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	1.00	UG/G	U	1.00	1
NA	QCLCS57444-2	Fluoride	16984-48-8	QCBLK57444-2	01/20/95	01/20/95	103	%REC			1

RJS 4/7/95

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Quanterra
Environmental Services

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: Sulfate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	9.86	UG/G	U	9.86	1
BODMT6	7344-001DUP	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	9.84	UG/G	U	9.84	1
BODMT6	7344-001MS	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	101	%REC			5
BODMT2	7344-002	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	2230	UG/G		170	10
BODMT3	7344-004	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	4040	UG/G		306	10
NA	QCBLK57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	10.0	UG/G	U	10.0	1
NA	QCLCS57444-2	Sulfate	14808-79-8	QCBLK57444-2	01/20/95	01/20/95	97	%REC			1

RJS 4/7/95

C1116

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Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: TOX
Method: EPA 9020
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	47.1	UG/G	U	47.1	1
BODMT6	7344-001DUP	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	46.1	UG/G	U	46.1	1
BODMT6	7344-001MS	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	101	%REC			1
BODMT2	7344-002	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	86.8	UG/G	U	86.8	1
BODMT3	7344-004	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	150	UG/G	U	150	1
NA	QCBLK58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	50.0	UG/G	U	50.0	1
NA	QCLCS58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	99	%REC			1

RJS 4/1/95

01221

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Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Quanterra Environmental Services

Project: 550.56

Category: Sulfide
Method: EPA 9030
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.8	UG/G		10.6	1
BODMT6	7344-001DUP	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.6	UG/G	U	10.6	1
BODMT6	7344-001MS	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	78	%REC			1
BODMT2	7344-002	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	21.0	UG/G		19.0	1
BODMT3	7344-004	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	44.7	UG/G		34.0	1
NA	QCBLK57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	10.6	UG/G	U	10.6	1
NA	QCLCS57691-1	Sulfide	18496-25-8	QCBLK57691-1	01/23/95	01/23/95	84	%REC			1

RJS 4/7/95

01211

9613497.1466

Quanterra-Richland
P.O. Box 1970
Richland, WA 99352

Project: 550.56

Category: NO2-NO3
Method: EPA 353.1
Matrix: SOLID

Sample Date : 01/17/95
Receipt Date : 01/18/95
Report Date : 03/01/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMT6	7344-001	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.48	UG/G	U	0.48	1
BODMT6	7344-001DUP	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	U	0.50	1
BODMT6	7344-001MS	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	104	%REC			1
BODMT2	7344-002	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	53.4	UG/G		4.40	5
BODMT3	7344-004	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	35.4	UG/G		3.09	2
NA	QCBLK57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	0.50	UG/G	U	0.50	1
NA	QCLCS57497-2	Nitrate/Nitrite	C-005	QCBLK57497-2	01/24/95	01/24/95	92	%REC			1

RJS 4/7/95

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
P.O. Box 1970
Richland, Washington 99352

March 1, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 18, 1995
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W0429
Data Deliverable	:	Standalone

I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7344-002	B0DMT2	50132203	Soil	01/18/95
7344-004	B0DMT3	50132205	Soil	01/18/95

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Quanterra
Environmental Services

Analyses requested: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 is included in this SDG to meet requirements.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike

V. Comments

Samples arrived in St. Louis at 0°C which is not within the recommended 4°C ± 2°C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See ROD-B95-013.

Quanterra
Environmental Services

Sample 7344-001 is included in this package only for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.

Quanterra
Environmental Services

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Abby Dolden for Wade Price

Wade H. Price
Project Manager
e:\\sqmlo01\price$\abbydave\hanford\hanw0429.nar

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

1-17-95 WST

Page 1 of 12

Data Turnaround: [ ] Priority [X] Normal — WST 1-17-95

Collector: Dave St. John, Doug Bowers/Also Wendy Thompson	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: SNL 457 and ER 14	Field Logbook No.	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks: COOL TO 4 DEGREES CENTIGRADE		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	Cool 4°	COOL 4	Cool 4°					
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	G	G				
No. of Container(s)	1	1	1	1	1	1	1	1	3	1	1	1				
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	500ml	950ml				
SAMPLE ANALYSIS	ICP METALS-TAL/AA MATALS (As, Pb, Se, Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	Total alpha beta Gamma Spec	total alpha beta gamma Spec	501323			

501322

Sample No.	Matrix*	Date Sampled	Time Sampled														
~~WST 1-17-95~~ ~~CODMR4~~ BODMT6	01 S	1/17/95	0902	X	X	X	X	X	X	X	X	X	X	X	X	01	
BODMS9	2S	1/17/95	0907	X A			X B	X C				X	X	X	X	2	
BODMT2	3S	1/17/95	0935	X	X	X	X	X	X	X	X	X	X	X	X	3	
BODMR2	4S	1/17/95	0935	X	X	X	X	X	X	X	X	X	X			4	
BODMT3	5S	1/17/95	1047	X	X	X	X	X	X	X	X	X	X	X	X	5	
BODMR3	6S	1/17/95	1047	X	X	X	X	X	X	X	X	X	X	X	X	6	

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By	Doug Bowers	1-18-95/0830
Received By	ERC B.Whitten	0830 1-18-95
Relinquished By	ERC B.Whitten	1058 1-18-95
Received By	R. Boyd Quinton	1-18-95 1058
Relinquished By		
Received By		
Relinquished By		
Received By		

SPECIAL INSTRUCTIONS

DATA DELIVERABLE-STAND ALONE.
LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET.

*=THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g

BODMT2 - total alpha/beta/gamma provided in 1x500ml and 1x950ml.

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: SDG W0386
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

RCS 11/7/95

REV. 3 .

DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY:
1. EXPEDITED RESPONSE ACTION
2. ✓ TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA ✓ RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY ✓ REGULAR ✓ RADCHEM

SAMPLE MATRIX: ✓ SOIL/SEDIMENT WATER VEGETATION OILS
SLUDGE CONCRETE OTHER _____

LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
Quanterra (Main)	Not Applicable	N/A
Lockheed (Split)	Not Applicable	N/A

COMMENTS:

▸▸ Revision 1 — Changes to the EAL bottle requirements.

▸▸ Revision 2 — Change to laboratories.

▸▸ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

▸▸ Data Deliverable — Standalone

▸▸ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

~~PAGE 1 OF 1~~

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

DATE: 01/31/95	LABORATORY: Quanterra
PROJECT TITLE/NO.: 100-D Ponds/B94-098	NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable)

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable)

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples B0DMT2 and B0DMT3 should be reported in one standalone data package. Results for samples B0DMT6, B0DMS9, B0DMR2, B0DMR3, and B0DMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample B0DMT4 should be reported in one standalone data package. Results from samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, and B0DMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith/ _____ 1/31/95
OSM Project Coordinator (Print/Sign Name) Date

M.T. Stankovich/ _____ 2/13/95
Technical Representative (Print/Sign Name) Date

N/A
Quality Assurance (Print/Sign Name) Date

9613497.1475

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-02041-3

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng. Support	Field & Analytical Supp	Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☐ Prepaid ☐ Collect

Shipped to	Off-site Custodian
Company: Quanterra (IT) Address: 2800 Geo Wash Way City: Richland, State: Washington, Zip Code: 99352 Country	On-site Custodian / Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: B0DMT6 B0DMS9 B0DMT2 B0DMR2 B0DMT3 B0DMR3 Cooler ID: SML-457 & ER41 B0DMT5 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		~~Sample #:~~ Cooler ID: Polycooler with groundwater ~~samples~~ packed in wet ice and vermiculite	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☒ Required for Project Work. List Project No. 100-D-PONDS PHASE II

☐ Business Trip Bill of Lading #: N/A

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. N/A

☐ Other (Please specify) Sampling supports RI/FS work in the 100 AREA

RECEIVED

JAN 18 1995

PROPERTY RECORDS

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
Paul Rasco	RARA - 0051	1-18-95

Location of and Contact for Property (Name/Phone No./Bldg./Area)

B.T. Whitten (509) 376-7777

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
1-18-95	ITE 2072 PV3AA	

Originated By	Date	Authorized By	Date
B.J. WHITTEN	1-18-95	B.J. Whitten	1-18-95
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		Debbie Rives	1/18/95

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date
~~GO2 05~~	

DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

*U.S. GPO: 1994-592-170/00029

R. Brad Quanterra 1/18/95 1050 000028

54-3000-479 (01/94)

Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: WHC/BHI			DATA PACKAGE: W0429-QES		
VALIDATOR: RJS		LAB: Quanterra		DATE: 3/31/95	
CASE: 100-DR-1			SDG: W0429		

ANALYSES PERFORMED					
☒ Anions/IC	☐ TOC	☒ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☒ Chloride	☐ Chromium-VI	☐ pH	☒ NO_3/NO_2
☒ Sulfate	☐ TDS	☐ TKN	☒ Phosphate	☐	☒ Nitrate
☒ Fluoride	☒ Sulfide	☐	☐	☐	☒ Nitrite

SAMPLES/MATRIX

BODMT2 (soil)
BODMT3

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~~ ~~BC~~ for RJS N/A

Comments:

Chloride -28 days ✓
Fluoride -28 days ✓
Nitrate - 2 days ~~(3) "J"~~ BC
Nitrite 2 days ~~(3) "J"~~ BC
O-Phosphate -2 days ~~(3) "J"~~ BC
per RJS 5/5/95

Sulfate -28 days ✓
NO_3/NO_2 - 28 days ✓
Sulfide - 7 days ✓
TOX - 28 days ✓

~~A-23~~ BC

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses?	(Yes)	No	N/A
Are initial calibration results acceptable?	(Yes)	No	N/A
Was a calibration check performed for all applicable analyses?	(Yes)	No	N/A
Are calibration check results 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 spike samples analyzed at the required frequency?	(Yes)	No	N/A
Are spike recoveries acceptable?	(Yes)	No	N/A
Were LCS analyses performed at the required frequency?	(Yes)	No	N/A
Are LCS recoveries acceptable?	(Yes)	No	N/A

Comments:_____

6. PRECISION

Were laboratory duplicate samples analyzed at the required frequency?	(Yes)	No	N/A
Are laboratory duplicate sample 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)

A-24-BC

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments:_____

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . (Yes) No N/A

Comments:_____

8. REPORTED RESULTS AND DETECTION LIMITS

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

Are 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:_____

A-25(c)

HOLDING TIME SUMMARY

SDG: W0429	VALIDATOR: RJS				DATE:	PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
BODMT2	Nitrate	1/17/95	1/20/95	1/20/95	—	3	J
BODMT3							
BODMT2	Nitrite	1/17/95	1/20/95	1/20/95	—	3	UJ
BODMT3							
BODMT2	Phosphate	1/17/95	1/20/95	1/20/95	—	3	UJ
BODMT3							

WHC-SD-EN-SPP-002, Rev. 2

9613497.1480

0000033

RECORD COPY

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Volatiles - Data Package No. W0429-QES (SDG No. W0429)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-QES prepared by Quanterra Environmental Services (QTES). 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 Level	Analysis
B0DMT2	01/17/95	Soil	D	See Note 1
B0DMT3	01/17/95	Soil	D	See Note 1

Note 1. Requested Method: VOA-TCL

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualifications
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 analyzed within 14 days of the date of sample collection.

If holding times are exceeded, but not by >2x 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 >2x 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.

- **Instrument Calibration and Tuning**

Instrument calibration is performed to establish that the GC/MS instrument is capable of producing acceptable and reliable analytical data over a range of concentrations. The initial and continuing calibrations are performed according to CLP protocols and all results must meet validation requirements set by Westinghouse-Hanford (WHC 1992,b). An initial multipoint calibration is performed prior to sample analysis to establish the linear range of the GC/MS instrument. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All initial and continuing calibration results were acceptable.

- **Blanks**

Method blank analyses are performed 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 <5X 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 <10x the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is <CRQL and is <10x (or <5x for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualifed as undetected "U". Tentatively identified compounds (TIC) present in the samples and blanks that are within +/-0.06 relative retention time units (RRT) of each other are qualified as undetected "U" if the sample concentration is <5x (or <10x for common laboratory contaminants) the highest blank concentration.

Due to the presence of positive blank results, sample numbers B0DMT2 and B0DMT3 were flagged "U" for acetone.

Due to the presence of positive blank results, sample number B0DMT2 was flagged "U" for methylene chloride.

All other method 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 analyses are performed in duplicate using five compounds and % recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results <5x 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 >5x the spike concentration require no qualification.

All matrix spike 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. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Compounds with surrogate recoveries <10% are qualified as estimates "J" for detects, and "UR" for nondetects. Undetected compounds with surrrogate recoveries greater than 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 by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples analyzed using SW-846 protocol,

results must be within RPD limits of +/-35%. If RPD values are out of specification and the sample concentration is <5x the spike concentration, all associated sample results are qualified as estimated "J" for detects, "UJ" for non-detects. If RPD values are out of specification and the sample concentration is >5x the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate RPD results were acceptable.

- **System Performance**

Internal Standards Performance

The evaluation of the internal standards criteria provide a means to assess the stability and sensitivity of the GC/MS system on every analysis. Internal standard area counts must be within the limits of -50% to +100% of the most recent standard. The retention time of the internal standard must not vary by more than +/-30 seconds of the most recent calibration. If area counts for a particular internal are outside the control limits or relative retention time criteria are > +/-30 seconds, all associated sample results are qualified as estimates (J for detects, UJ for non-detects). If area counts and retention times are both outside control limits, all non-detect sample results associated with that internal standard are qualified as unusable "UR".

All internal standard recovery results were acceptable.

Compound Identification

The identitiy of detected compounds are confirmed to investigate the possibility of false positives or false negatives. If a compound was incorrectly reported as undetected, the associated result is qualified as detected (no qualifier) or estimated "J". If retention time and mass spectral criteria are exceeded, all associated results are qualified as unusable and flagged "R". If it is determined that incorrect identifications were made as a result of cross-contamination or carryover between analyses, then the affected data are qualified as unusable and flagged "UR/R".

All compounds were identified correctly.

- **Sample Result Verification and Detection Limits**

The objective of a review of results quantitation and CRQLs is to determine if quantitation was performed accurately, CRQLs were calculated properly and that the project-specific CRQLs were met. Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors.

The reviewer verified that the results and detection limits fell within the linear range of the instrument.

All sample results and reported detection limits were acceptable.

- **Completeness**

  Data Package No. W0429-QES (SDG No. W0429) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Positive blank contamination was noted in two acetone results and in one methylene chloride result. All results were flagged acordingly. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1991b, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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 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: W0429	REVIEWER: SC	DATE: 3/27/95	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene Chloride	U	B0DMT2	Lab Blank Contamination
Acetone	U	B0DMT2, B0DMT3	Lab Blank Contamination

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (µg/Kg)

Project: WESTINGHOUSE-HANFORD																			
Laboratory: QUANTERRA																			
Case:	SDG: W0429																		
Sample Number		B0DMT2		B0DMT3															
Location		Test Pit #2		Test Pit #2															
Remarks																			
Sample Date		01/17/95		01/17/95															
Analysis Date		01/25/95		01/26/95															
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	18	U	31	U														
Bromomethane	10	18	U	31	U														
Vinyl Chloride	10	18	U	31	U														
Chloroethane	10	18	U	31	U														
Methylene Chloride	10	20	U	74	U														
Acetone	10	43	U	51	U														
Carbon Disulfide	10	9	U	16	U														
1,1-Dichloroethene	10	9	U	16	U														
1,1-Dichloroethane	10	9	U	16	U														
1,2-Dichloroethene (total)	10	9	U	16	U														
Chloroform	10	9	U	16	U														
1,2-Dichloroethane	10	9	U	16	U														
2-Butanone	10	180	U	310	U														
1,1,1-Trichloroethane	10	9	U	16	U														
Carbon Tetrachloride	10	9	U	16	U														
Bromodichloromethane	10	9	U	16	U														
1,2-Dichloropropane	10	9	U	16	U														
cis-1,3-Dichloropropene	10	9	U	16	U														
Trichloroethene	10	9	U	16	U														
Dibromochloromethane	10	9	U	16	U														
1,1,2-Trichloroethane	10	9	U	16	U														
Benzene	10	9	U	16	U														
trans-1,3-Dichloropropene	10	9	U	16	U														
Bromoform	10	9	U	16	U														
4-Methyl-2-pentanone	10	89	U	160	U														
2-Hexanone	10	89	U	160	U														
Tetrachloroethene	10	9	U	16	U														
1,1,2,2-Tetrachloroethane	10	9	U	16	U														
Toluene	10	9	U	16	U														
Chlorobenzene	10	9	U	16	U														
Ethylbenzene	10	9	U	16	U														
Styrene	10	9	U	16	U														
Xylene (total)	10	9	U	16	U														

QSC 4/18/95

9613497.1492

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0621

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 Date Analyzed: 01/25/95

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	18	U
74-83-9	Bromomethane	18	U
75-01-4	Vinyl Chloride	18	U
75-00-3	Chloroethane	18	U
75-09-2	Methylene Chloride	20	~~B~~ U
67-64-1	Acetone	43	~~B~~ U
75-15-0	Carbon Disulfide	9	U
75-35-4	1,1-Dichloroethene	9	U
75-34-3	1,1-Dichloroethane	9	U
540-59-0	1,2-Dichloroethene (total)	9	U
67-66-3	Chloroform	9	U
107-06-2	1,2-Dichloroethane	9	U
78-93-3	2-Butanone	180	U
71-55-6	1,1,1-Trichloroethane	9	U
56-23-5	Carbon Tetrachloride	9	U
75-27-4	Bromodichloromethane	9	U
78-87-5	1,2-Dichloropropane	9	U
10061-01-5	cis-1,3-Dichloropropene	9	U
79-01-6	Trichloroethene	9	U
124-48-1	Dibromochloromethane	9	U
79-00-5	1,1,2-Trichloroethane	9	U
71-43-2	Benzene	9	U
10061-02-6	trans-1,3-Dichloropropene	9	U
75-25-2	Bromoform	9	U
108-10-1	4-Methyl-2-Pentanone	89	U
591-78-6	2-Hexanone	89	U
127-18-4	Tetrachloroethene	9	U
79-34-5	1,1,2,2-Tetrachloroethane	9	U
108-88-3	Toluene	9	U
108-90-7	Chlorobenzene	9	U
100-41-4	Ethylbenzene	9	U
100-42-5	Styrene	9	U
1330-20-7	Xylene (total)	9	U

1a

3/27/95 SC

~~+ 00078~~

9613497.1493
1E

EPA SAMPLE NO.

B0DMT2

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0621

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 Date Analyzed: 01/25/95

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

3/27/95 SC

961349?.1494

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0635

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 Date Analyzed: 01/26/95

Column: (pack/cap) CAP Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	31	U
74-83-9	Bromomethane	31	U
75-01-4	Vinyl Chloride	31	U
75-00-3	Chloroethane	31	U
75-09-2	Methylene Chloride	74	B
67-64-1	Acetone	51	BJ
75-15-0	Carbon Disulfide	16	U
75-35-4	1,1-Dichloroethene	16	U
75-34-3	1,1-Dichloroethane	16	U
540-59-0	1,2-Dichloroethene (total)	16	U
67-66-3	Chloroform	16	U
107-06-2	1,2-Dichloroethane	16	U
78-93-3	2-Butanone	310	U
71-55-6	1,1,1-Trichloroethane	16	U
56-23-5	Carbon Tetrachloride	16	U
75-27-4	Bromodichloromethane	16	U
78-87-5	1,2-Dichloropropane	16	U
10061-01-5	cis-1,3-Dichloropropene	16	U
79-01-6	Trichloroethene	16	U
124-48-1	Dibromochloromethane	16	U
79-00-5	1,1,2-Trichloroethane	16	U
71-43-2	Benzene	16	U
10061-02-6	trans-1,3-Dichloropropene	16	U
75-25-2	Bromoform	16	U
108-10-1	4-Methyl-2-Pentanone	160	U
591-78-6	2-Hexanone	160	U
127-18-4	Tetrachloroethene	16	U
79-34-5	1,1,2,2-Tetrachloroethane	16	U
108-88-3	Toluene	16	U
108-90-7	Chlorobenzene	16	U
100-41-4	Ethylbenzene	16	U
100-42-5	Styrene	16	U
1330-20-7	Xylene (total)	16	U

9613497.1495

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: V34402 SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 5.00 (g/mL) G Lab File ID: F0635

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 Date Analyzed: 01/26/95

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

3/27/95 SC

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra
Environmental
Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
P.O. Box 1970
Richland, Washington 99352

March 1, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 18, 1995
Number of Samples	:	Two (2)
Sarnple Type	:	Soil
SDG Number	:	W0429
Data Deliverable	:	Standalone

I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7344-002	B0DMT2	50132203	Soil	01/18/95
7344-004	B0DMT3	50132205	Soil	01/18/95

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Quanterra
Environmental Services

Analyses requested: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 is included in this SDG to meet requirements.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike

V. Comments

Samples arrived in St. Louis at 0°C which is not within the recommended 4°C ± 2°C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See ROD-B95-013.

Quanterra
Environmental Services

Sample 7344-001 is included in this package only for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.

Quanterra
Environmental Services

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Abby Wolden for Wade Price

Wade H. Price
Project Manager
e:\\sqtmlo01\price$\abbydave\hanford\hanw0429.nar

Westinghouse Hanford Company	**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST** 1-17-95 WST	Page 1 of ~~1~~ 2

Data Turnaround: [ ] Priority [X] Normal — WST 1-17-95

Collector: Dave St. John, Doug Bowers, ~~Do~~ Wendy Thompson	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: SML 457 and ER 14	Field Logbook No.:	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.:	Bill of Lading/Air Bill No.: N/A

Possible Sample Hazards/Remarks:

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	Cool 4°	COOL 4	Cool 4°			
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	G	G		
No. of Container(s)	1	1	1	1	1	1	1	1	3	1	1	1		
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	500ml	950ml		
SAMPLE ANALYSIS 501322	ICP METALS-TAL/AA MATALS (As,Pb,Se,Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F,Cl,SO4,PO4,NO2,NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	Total alpha beta Gamma Spec	total alpha beta gamma Spec	501323	

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	Total Alpha/Beta, GEA	Activity Scan	Total alpha beta Gamma Spec (500ml)	total alpha beta gamma Spec (950ml)	501323	
WST 1-17-95 ~~BODMR4~~ BODMT6	1 S	1/17/95	0902	X	X	X	X	X	X	X	X	X WST 1-17-95	X	X	X	01	
BODMS9	2 S	1/17/95	0907	X A			X B	X C				WST	X	X	X	2	
BODMT2	3 S	1/17/95	0935	X	X	X	X	X	X	X	X	X	X	X	X	3	
BODMR2	4 S	1/17/95	0935	X	X	X	X	X	X	X	X	X	X			4	
BODMT3	5 S	1/17/95	1047	X	X	X	X	X	X	X	X		X	X	X	5	
BODMR3	6 S	1/17/95	1047	X	X	X	X	X	X	X	X	X	X			6	

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-18-95/0830	B. Whitten ERC	0830 1-18-95
B. Whitten ERC	1-18-95 1058	A. Boyd Quanterra	1-18-95 1050

SPECIAL INSTRUCTIONS

DATA DELIVERABLE-STAND ALONE.
LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET.

*=THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g

BODMT2 - total alpha/beta/gamma provided in 1x500ml and 1x950ml.

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 SDG W0386
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

1051 2612 96

T00000

9613497.1502

OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

RCS 1/17/95

REV. 3 . DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY:
1. EXPEDITED RESPONSE ACTION
2. ✓ TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA ✓ RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY ✓ REGULAR ✓ RADCHEM

SAMPLE MATRIX: ✓ SOIL/SEDIMENT WATER VEGETATION OILS
SLUDGE CONCRETE OTHER _____

LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
Quanterra (Main)	Not Applicable	N/A
Lockheed (Split)	Not Applicable	N/A

COMMENTS:

▸▸ Revision 1 — Changes to the EAL bottle requirements.

▸▸ Revision 2 — Change to laboratories.

▸▸ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

▸▸ Data Deliverable — Standalone

▸▸ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

~~PAGE 1 OF 1~~

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

DATE: 01/31/95 | **LABORATORY: Quanterra**

PROJECT TITLE/NO.: 100-D Ponds/B94-098 | **NCR NO.: N/A**

SAMPLE IDENTIFICATION NUMBERS:

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable)

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable)

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples B0DMT2 and B0DMT3 should be reported in one standalone data package. Results for samples B0DMT6, B0DMS9, B0DMR2, B0DMR3, and B0DMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample B0DMT4 should be reported in one standalone data package. Results from samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, and B0DMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith/ _____ 1/31/95
OSM Project Coordinator (Print/Sign Name) Date

M.T. Stankovich/ _____ 2/13/95
Technical Representative (Print/Sign Name) Date

N/A
Quality Assurance (Print/Sign Name) Date

9613497.1504

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-02041-3

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng. Support	Field & Analytical Supp	Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☐ Prepaid ☐ Collect

Shipped to
Company: Quanterra (IT)
Address: 2800 Geo Wash Way
City: Richland, State: Washington, Zip Code: 99352
Country:

Off-site Custodian:

On-site Custodian: Payroll No.:

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: B0DMT6 B0DMS9 B0DMT2 B0DMR2 B0DMT3 B0DMR3 Cooler ID: SML-457 & ER-41 B0DMT5 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		Sample #: Cooler ID: Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☒ Required for Project Work. List Project No. 100-D-PONDS PHASE II

☐ Business Trip Bill of Lading #: N/A

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. N/A

☐ Other (Please specify) Sampling supports RI/FS work in the 100 AREA

RECEIVED
JAN 18 1995
PROPERTY RECORDS

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
[signature]	RARA - 0051	1-18-95

Location of and Contact for Property (Name/Phone No./Bldg./Area)
B.T. Whitten (509) 376-7777

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
1-18-95	ITE 2072 PV3AA	

Originated By	Date	Authorized By	Date
B.T. WHITTEN	1-18-95	[signature]	1-18-95
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		Debbie Rives	1/18/95

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date
[signature]	

DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

*U.S. GPO: 1994-592-170/00029

R. Brad Quanterra 1/18/95 1050

000024

54-3000-479 (01/94)

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: Westinghouse-Hanford			DATA PACKAGE: SAF-B94-098		
VALIDATOR: S. Chari		LAB: Quanterra		DATE: 3/27/95	
CASE: V34402			SDG: W0429		

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 Soil - BODMT2, BODMT3

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

A 1B

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: VBLK01 (sample associated: BODMT2): Acetone detect: 20, Methylene chloride: 5 (common contamenants: 10X Acetone: 200, MC: 50) Flagged "U" in sample. VBLK02 (sample associated: BODMT acetone: ~~10~~, Methylene chloride: 12: 10X: Samples flagged "U" for acetone only

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: _____

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:_____

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:_____

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

Lab blank contamination

BODMT2: "U" for acetone & methylene chloride.

BODMT3: "U" for acetone

A-4 BC

BLANK AND SAMPLE DATA SUMMARY

SDG: W0429 | REVIEWER: SC | DATE: 3/27/95 | PAGE 1 OF 1

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK01	Methylene Chloride	5			ug/Kg	25	50	B0DMT2	U
VBLK01	Acetone	20	J		ug/Kg	100	200	B0DMT2	U
VBLK02	Methylene Chloride	5			ug/Kg	25	50	B0DMT3	None
VBLK02	Acetone	12	J		ug/Kg	60	120	B0DMT3	U

0000030

9613497.1510

HOLDING TIME SUMMARY

SDG: W0429	REVIEWER: SC			DATE: 3/27/95		PAGE 1 OF 1	
COMMENTS: No problems. All within limits							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER

CALIBRATION DATA SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/27/95		PAGE 1 OF 1	
COMMENTS: No problems.					
CALIB. TYPE: INITIAL CONTINUING		INSTRUMENT:			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER

961349?. 1512

000032

ACCURACY DATA SUMMARY

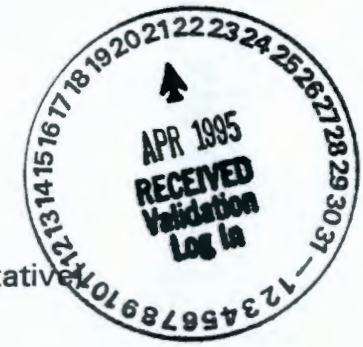
SDG: W0429	REVIEWER: SC	DATE: 3/27/95	PAGE 1 OF 1	
COMMENTS: No problems.				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED

PRECISION DATA SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/27/95	PAGE 1 OF 1

COMMENTS: No problems.

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER



Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Semi-Volatiles - Data Package No. W0429-QES (SDG No. W0429)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-QES prepared by Quanterra Environmental Services (QTES). 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 Level	Analysis
B0DMT2	01/17/95	Soil	D	See Note 1
B0DMT3	01/17/95	Soil	D	See Note 1

Note 1. Requested Method: Semi-VOA-TCL

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualifications
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 >2x 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 >2x 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.

- **Instrument Calibration and Tuning**

Instrument calibration is performed to establish that the GC/MS instrument is capable of producing acceptable and reliable analytical data over a range of concentrations. The initial and continuing calibrations are performed according to CLP protocols and all results must meet validation requirements set by Westinghouse-Hanford (WHC 1992,b). An initial multipoint calibration is performed prior to sample analysis to establish the linear range of the GC/MS instrument. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All initial and continuing calibration results were acceptable.

- **Blanks**

Method blank analyses are performed 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 <5X 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 <10x the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is <CRQL and is <10x (or <5x for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U". Tentatively identified compounds (TIC) present in the samples and blanks that are within +/-0.06 relative retention time units (RRT) of each other are qualified as undetected "U" if the sample concentration is <5x (or <10x for common laboratory contaminants) the highest blank concentration.

Due to the presence of positive blank results, sample numbers B0DMT2 and B0DMT3 were flagged "U" for aldol condensate.

Due to the presence of positive blank results, sample numbers B0DMT2 and B0DMT3 were flagged "U" for butylbenzylphthalate.

All other method 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 analyses are performed in duplicate using six compounds and percent recoveries must be within the established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results <5x 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 >5x the spike concentration require no qualification.

All matrix spike 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 >CRQL are qualified as estimates and flagged "J". Sample results <CRQL and below the lower control limit are qualified as estimates and flagged "UJ". Sample results <CRQL with recoveries above the upper control limit require no qualification. Compounds with surrogate recoveries <10% are qualified as "J" for detects, and "UR" for nondetects.

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 soil samples analyzed using SW-846 protocol, results must be within RPD limits of +/-35%. If RPD values are out of specification and the sample concentration is <5x 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 >5x the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate RPD results were acceptable.

- **System Performance**

Internal Standards Performance

The evaluation of the internal standards criteria provide a means to assess the stability and sensitivity of the GC/MS system on every analysis. Internal standard area counts must be within the limits of -50% to +100% of the most recent standard. The retention time of the internal standard must not vary by more than +/-30 seconds of the most recent calibration. If area counts for a particular internal are outside the control limits or relative retention time criteria are > +/-30 seconds, all associated sample results are qualified as estimates (J for detects, UJ for non-detects). If area counts and retention times are both outside control limits, all non-detect sample results associated with that internal standard are qualified as unusable "UR".

Due to an internal standard recovery outside control limits, all results associated with internal standard perylene-d12 have been qualified as estimates and flagged "UJ".

All other internal standard recovery results were acceptable.

Compound Identification

The identitiy of detected compounds are confirmed to investigate the possibility of false positives or false negatives. If a compound was incorrectly reported as undetected, the associated result is qualified as detected (no qualifier) or estimated "J". If retention time and mass spectral criteria are exceeded, all associated results are qualified as unusable and flagged "R". If it is determined that incorrect indentifications were made as a result of cross-contamination or carryover between analyses, then the affected data are qualified as unusable and flagged "UR/R".

All compounds were identified correctly.

- **Sample Result Verification and Detection Limits**

  The objective of a review of results quantitation and CRQLs is to determine if quantitation was performed accurately, CRQLs were calculated properly and that the project-specific CRQLs were met. Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

  All sample results and reported detection limits were acceptable.

- **Completeness**

  Data Package No. W0429-QES (SDG No. W0429) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Positive blank contamination was noted in two butylbenzylphthalate results and in two aldol condensate results. All results were flagged acordingly. Due to an internal standard recovery outside control limits, all results associated with internal standard perylene-d12 were qualified as estimates and flagged "UJ". Data flagged "J" indicate the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1991b, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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 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: W0429	REVIEWER: SC	DATE: 3/27/95	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Butylbenzylphthalate	U	B0DMT2, B0DMT3	Lab Blank Contamination
Aldol Condensate	U	B0DMT2, B0DMT3	Lab Blank Contamination
All results associated with internal std. perylene-d12	UJ	B0DMT2, B0DMT3	Internal standard and recovery outside of limits

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

SEMI–VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (µg/Kg)

Project: WESTINGHOUSE–HANFORD																					
Laboratory: QUANTERRA																					
Case:	SDG: W0429																				
Sample Number		B0DMT2		B0DMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks																					
Sample Date		01/17/95		01/17/95																	
Extraction Date		01/20/95		01/20/95																	
Analysis Date		01/23/95		01/23/95																	
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	1200	U	2100	U																
bis(2–Chloroethyl)ether	330	1200	U	2100	U																
2–Chlorophenol	330	1200	U	2100	U																
1,3–Dichlorobenzene	330	1200	U	2100	U																
1,4–Dichlorobenzene	330	1200	U	2100	U																
1,2–Dichlorobenzene	330	1200	U	2100	U																
2–Methylphenol	330	1200	U	2100	U																
2,2'–oxybis(1–Chloropropane)	330	1200	U	2100	U																
4–Methylphenol	330	1200	U	2100	U																
N–Nitroso–di–n–propylamine	330	1200	U	2100	U																
Hexachloroethane	330	1200	U	2100	U																
Nitrobenzene	330	1200	U	2100	U																
Isophorone	330	1200	U	2100	U																
2–Nitrophenol	330	1200	U	2100	U																
2,4–Dimethylphenol	330	1200	U	2100	U																
bis(2–Chloroethoxy)methane	330	1200	U	2100	U																
2,4–Dichlorophenol	330	1200	U	2100	U																
1,2,4–Trichlorobenzene	330	1200	U	2100	U																
Naphthalene	330	1200	U	2100	U																
4–Chloroaniline	1700	2300	U	4100	U																
Hexachlorobutadiene	330	1200	U	2100	U																
4–Chloro–3–methylphenol	1700	2300	U	4100	U																
2–Methylnaphthalene	330	1200	U	2100	U																
Hexachlorocyclopentadiene	330	1200	U	2100	U																
2,4,6–Trichlorophenol	330	1200	U	2100	U																
2,4,5–Trichlorophenol	330	1200	U	2100	U																
2–Chloronaphthalene	330	1200	U	2100	U																
2–Nitroaniline	1700	5900	U	10000	U																
Dimethylphthalate	330	1200	U	2100	U																
Acenaphthylene	330	1200	U	2100	U																
2,6–Dinitrotoluene	330	1200	U	2100	U																

RBC 4/18/95

SEMI–VOLATILE ORGANIC ANALYSIS, SOIL MATRIX, (µg/Kg)

Project: WESTINGHOUSE–HANFORD																					
Laboratory: QUANTERRA																					
Case:	SDG: W0429																				
Sample Number		B0DMT2		B0DMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks																					
Sample Date		01/17/95		01/17/95																	
Extraction Date		01/20/95		01/20/95																	
Analysis Date		01/23/95		01/23/95																	
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	1700	5900	U	10000	U																
Acenaphthene	330	1200	U	2100	U																
2,4–Dinitrophenol	1700	5900	U	10000	U																
4–Nitrophenol	1700	5900	U	10000	U																
Dibenzofuran	330	1200	U	2100	U																
2,4–Dinitrotoluene	330	1200	U	2100	U																
Diethylphthalate	330	1200	U	2100	U																
4–Chlorophenyl–phenyl ether	330	1200	U	2100	U																
Fluorene	330	1200	U	2100	U																
4–Nitroaniline	1700	2300	U	4100	U																
4,6–Dinitro–2–methylphenol	1700	5900	U	10000	U																
N–Nitrosodiphenylamine	330	1200	U	2100	U																
4–Bromophenyl–phenylether	330	1200	U	2100	U																
Hexachlorobenzene	330	1200	U	2100	U																
Pentachlorophenol	1700	5900	U	10000	U																
Phenanthrene	330	440	J	470	J																
Anthracene	330	430	J	460	J																
Carbazole	330	1200	U	2100	U																
Di–n–butylphthalate	330	170	J	2100	U																
Fluoranthene	330	590	J	940	J																
Pyrene	330	570	J	820	J																
Butylbenzylphthalate	330	1200	U	2100	U																
3,3'–Dichlorobenzidine	330	2300	U	4100	U																
Benzo(a)anthracene	330	180	J	340	J																
Chrysene	330	220	J	400	J																
bis(2–Ethylhexyl)phthalate	330	81	J	130	J																
Di–n–octylphthalate	330	1200	UJ	2100	UJ																
Benzo(b)fluoranthene	330	420	J	580	J																
Benzo(k)fluoranthene	330	130	J	220	J																
Benzo(a)pyrene	330	1200	UJ	290	J																
Indeno(1,2,3–cd)pyrene	330	1200	UJ	2100	UJ																
Dibenz(a,h)anthracene	330	1200	U	2100	UJ																
Benzo(g,h,i)perylene	330	1200	U	2100	UJ																

RBC 4/18/95

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	1200	U
111-44-4	bis(2-Chloroethyl)Ether	1200	U
95-57-8	2-Chlorophenol	1200	U
541-73-1	1,3-Dichlorobenzene	1200	U
106-46-7	1,4-Dichlorobenzene	1200	U
95-50-1	1,2-Dichlorobenzene	1200	U
95-48-7	2-Methylphenol	1200	U
108-60-1	2,2'-oxybis(1-Chloropropane)	1200	U
106-44-5	4-Methylphenol	1200	U
621-64-7	N-Nitroso-Di-n-Propylamine	1200	U
67-72-1	Hexachloroethane	1200	U
98-95-3	Nitrobenzene	1200	U
78-59-1	Isophorone	1200	U
88-75-5	2-Nitrophenol	1200	U
105-67-9	2,4-Dimethylphenol	1200	U
111-91-1	bis(2-Chloroethoxy)Methane	1200	U
120-83-2	2,4-Dichlorophenol	1200	U
120-82-1	1,2,4-Trichlorobenzene	1200	U
91-20-3	Naphthalene	1200	U
106-47-8	4-Chloroaniline	2300	U
87-68-3	Hexachlorobutadiene	1200	U
59-50-7	4-Chloro-3-Methylphenol	2300	U
91-57-6	2-Methylnaphthalene	1200	U
77-47-4	Hexachlorocyclopentadiene	1200	U
88-06-2	2,4,6-Trichlorophenol	1200	U
95-95-4	2,4,5-Trichlorophenol	1200	U
91-58-7	2-Chloronaphthalene	1200	U
88-74-4	2-Nitroaniline	5900	U
131-11-3	Dimethyl Phthalate	1200	U
208-96-8	Acenaphthylene	1200	U
606-20-2	2,6-Dinitrotoluene	1200	U

3/27/95 SC

~~00285~~

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT2

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q	
99-09-2	3-Nitroaniline	5900	U	
83-32-9	Acenaphthene	1200	U	
51-28-5	2,4-Dinitrophenol	5900	U	
100-02-7	4-Nitrophenol	5900	U	
132-64-9	Dibenzofuran	1200	U	
121-14-2	2,4-Dinitrotoluene	1200	U	
84-66-2	Diethylphthalate	1200	U	
7005-72-3	4-Chlorophenyl-phenylether	1200	U	
86-73-7	Fluorene	1200	U	
100-01-6	4-Nitroaniline	2300	U	
534-52-1	4,6-Dinitro-2-Methylphenol	5900	U	
86-30-6	N-Nitrosodiphenylamine (1)	1200	U	
101-55-3	4-Bromophenyl-phenylether	1200	U	
118-74-1	Hexachlorobenzene	1200	U	
87-86-5	Pentachlorophenol	5900	U	
85-01-8	Phenanthrene	440	J	
120-12-7	Anthracene	430	J	
86-74-8	Carbazole	1200	U	
84-74-2	Di-n-Butylphthalate	170	J	
206-44-0	Fluoranthene	590	J	lab
129-00-0	Pyrene	570	J	blank
85-68-7	Butylbenzylphthalate	1200 ~~820~~	~~BJ~~ U	
91-94-1	3,3'-Dichlorobenzidine	2300	U	
56-55-3	Benzo(a)Anthracene	180	J	
218-01-9	Chrysene	220	J	
117-81-7	bis(2-Ethylhexyl)Phthalate	81	J	
117-84-0	Di-n-Octyl Phthalate	1200	UJ	intern std
205-99-2	Benzo(b)Fluoranthene	420	J	
207-08-9	Benzo(k)Fluoranthene	130	J	
50-32-8	Benzo(a)Pyrene	1200	UJ	inter std
193-39-5	Indeno(1,2,3-cd)Pyrene	1200	UJ	
53-70-3	Dibenz(a,h)Anthracene	1200	U	
191-24-2	Benzo(g,h,i)Perylene	1200	U	

(1) - Cannot be separated from Diphenylamine

9613497.1529

1F

EPA SAMPLE NO.

B0DMT2

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7716

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 44 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 22 CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	0	Aldol Condensation	4.64	25000	~~ABJ~~ U
2.		Aldol Condensation	4.70	2600	~~ABJ~~ U
3.		UNKNOWN	16.77	240	J
4.		UNKNOWN	18.59	2800	J
5.		Unknown Alkane	18.84	1200	J
6.		Unknown Alkane	18.94	320	J
7.		Unknown Alkane	19.44	290	J
8.		UNKNOWN	20.50	390	J
9.		Unknown C12H6Cl4	22.92	220	J
10.		Unknown C12H6Cl4	23.02	340	J
11.		Unknown C12H5Cl5	23.53	1400	J
12.		Unknown C12H5Cl5	24.07	590	J
13.		Unknown C12H4Cl6	24.46	560	J
14.		Unknown C12H4Cl6	24.70	990	J
15.		Unknown C12H5Cl5	24.79	900	J
16.		Unknown C12H4Cl6	25.22	1100	J
17.		Unknown C12H4Cl6	25.75	1200	J
18.		Unknown C12H3Cl7	26.02	500	J
19.		Unknown C12H3Cl7	27.03	650	J
20.		UNKNOWN	28.32	610	J
21.		UNKNOWN	29.60	1000	J
22.		UNKNOWN	29.88	1100	J

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3/27/95 SC

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	2100	U
111-44-4	bis(2-Chloroethyl)Ether	2100	U
95-57-8	2-Chlorophenol	2100	U
541-73-1	1,3-Dichlorobenzene	2100	U
106-46-7	1,4-Dichlorobenzene	2100	U
95-50-1	1,2-Dichlorobenzene	2100	U
95-48-7	2-Methylphenol	2100	U
108-60-1	2,2'-oxybis(1-Chloropropane)	2100	U
106-44-5	4-Methylphenol	2100	U
621-64-7	N-Nitroso-Di-n-Propylamine	2100	U
67-72-1	Hexachloroethane	2100	U
98-95-3	Nitrobenzene	2100	U
78-59-1	Isophorone	2100	U
88-75-5	2-Nitrophenol	2100	U
105-67-9	2,4-Dimethylphenol	2100	U
111-91-1	bis(2-Chloroethoxy)Methane	2100	U
120-83-2	2,4-Dichlorophenol	2100	U
120-82-1	1,2,4-Trichlorobenzene	2100	U
91-20-3	Naphthalene	2100	U
106-47-8	4-Chloroaniline	4100	U
87-68-3	Hexachlorobutadiene	2100	U
59-50-7	4-Chloro-3-Methylphenol	4100	U
91-57-6	2-Methylnaphthalene	2100	U
77-47-4	Hexachlorocyclopentadiene	2100	U
88-06-2	2,4,6-Trichlorophenol	2100	U
95-95-4	2,4,5-Trichlorophenol	2100	U
91-58-7	2-Chloronaphthalene	2100	U
88-74-4	2-Nitroaniline	10000	U
131-11-3	Dimethyl Phthalate	2100	U
208-96-8	Acenaphthylene	2100	U
606-20-2	2,6-Dinitrotoluene	2100	U

961349?.1531

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

B0DMT3

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	10000	U
83-32-9	Acenaphthene	2100	U
51-28-5	2,4-Dinitrophenol	10000	U
100-02-7	4-Nitrophenol	10000	U
132-64-9	Dibenzofuran	2100	U
121-14-2	2,4-Dinitrotoluene	2100	U
84-66-2	Diethylphthalate	2100	U
7005-72-3	4-Chlorophenyl-phenylether	2100	U
86-73-7	Fluorene	2100	U
100-01-6	4-Nitroaniline	4100	U
534-52-1	4,6-Dinitro-2-Methylphenol	10000	U
86-30-6	N-Nitrosodiphenylamine (1)	2100	U
101-55-3	4-Bromophenyl-phenylether	2100	U
118-74-1	Hexachlorobenzene	2100	U
87-86-5	Pentachlorophenol	10000	U
85-01-8	Phenanthrene	470	J
120-12-7	Anthracene	460	J
86-74-8	Carbazole	2100	U
84-74-2	Di-n-Butylphthalate	2100	U
206-44-0	Fluoranthene	940	J
129-00-0	Pyrene	820	J
85-68-7	Butylbenzylphthalate	~~1400~~ 2102	~~B~~ U
91-94-1	3,3'-Dichlorobenzidine	4100	U
56-55-3	Benzo(a)Anthracene	340	J
218-01-9	Chrysene	400	J
117-81-7	bis(2-Ethylhexyl)Phthalate	130	J
117-84-0	Di-n-Octyl Phthalate	2100	U J
205-99-2	Benzo(b)Fluoranthene	580	J
207-08-9	Benzo(k)Fluoranthene	220	J
50-32-8	Benzo(a)Pyrene	290	J
193-39-5	Indeno(1,2,3-cd)Pyrene	2100	U J
53-70-3	Dibenz(a,h)Anthracene	2100	U
191-24-2	Benzo(g,h,i)Perylene	2100	U

(1) - Cannot be separated from Diphenylamine

3/27/95 E

IF

EPA SAMPLE NO.

B0DMT3

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: QUANTERRA MO Contract: 550-56

Lab Code: ITMO Case No.: S34402 SAS No.: SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.00 (g/mL) G Lab File ID: A7718

Level: (low/med) LOW Date Received: 01/18/95

% Moisture: not dec. 68 dec. Date Extracted: 01/20/95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01/23/95

GPC Cleanup: (Y/N) N pH: Dilution Factor: 1.00

Number TICs found: 18

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	0	Aldol Condensation	4.65	36000	~~ABJ~~ U
2.		UNKNOWN	16.77	240	J
3.		UNKNOWN	18.59	4600	J
4.		Unknown Alkane	18.85	2100	J
5.		UNKNOWN	18.94	260	J
6.		Unknown Alkane	19.45	230	J
7.		UNKNOWN	20.50	620	J
8.		UNKNOWN	20.97	360	J
9.		UNKNOWN	21.82	230	J
10.		UNKNOWN	26.55	230	J
11.		UNKNOWN	28.12	270	J
12.		UNKNOWN	28.30	280	J
13.		UNKNOWN	29.56	600	J
14.		UNKNOWN	30.48	440	J
15.		UNKNOWN	31.19	360	J
16.		UNKNOWN	31.39	490	J
17.		UNKNOWN	31.75	410	J
18.		UNKNOWN	32.01	700	J

3/7/95 SC

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
P.O. Box 1970
Richland, Washington 99352

March 1, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 18, 1995
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W0429
Data Deliverable	:	Standalone

I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7344-002	B0DMT2	50132203	Soil	01/18/95
7344-004	B0DMT3	50132205	Soil	01/18/95

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Quanterra
Environmental Services

Analyses requested: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 is included in this SDG to meet requirements.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike

V. Comments

Samples arrived in St. Louis at 0°C which is not within the recommended 4°C ± 2°C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See ROD-B95-013.

Quanterra Environmental Services

Sample 7344-001 is included in this package only for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.

Quanterra
Environmental Services

Bechtel Hanford Incorporated
March 1, 1995
Project Number: 550.56
SDG: W0429
Page 4

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Abby L Dolden for Wade Price

Wade H. Price
Project Manager
e:\\sqmlo01\price5\abbydave\hanford\hanw0429.nar

00939

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

1-17-95 WST

Data Turnaround: [ ] Priority [X] Normal — WST 1-17-95

Collector: Dave St. John, Doug Bowers, Wendy Thompson	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: SML 457 and ER 14	Field Logbook No.:	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.:	Bill of Lading/Air Bill No.: N/A

Possible Sample Hazards/Remarks:

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

SAMPLE ANALYSIS 501322 … 501323

	A	B	C	D	E	F	G	H				
Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	Cool 4°	COOL 4	Cool 4°	
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	G	G
No. of Container(s)	1	1	1	1	1	1	1	1	3	1	1	1
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	500ml	950ml
Analysis	ICP METALS-TAL/AA MATALS (As,Pb,Se,Tl)	VOA-TCL	SEMI-VOA-TCL	PCB/PEST	SULFIDE	TOX	ANIONS-IC(F, Cl,SO4, PO4, NO2, NO3)	NO2-NO3	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	Total alpha beta Gamma Spec	total alpha beta gamma Spec

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	Total α/β GEA	Activity Scan	Total α/β γ 500ml	Total α/β γ 950ml	
~~BODMR4~~ BODMT6 (WST 1-17-95)	1 S	1/17/95	0902	X	X	X	X	X	X	X	X	X (WST)	X	X	X	01
BODMS9	2 S	1/17/95	0907	X A			X B	X C				(WST)				2
BODMT2	3 S	1/17/95	0935	X	X	X	X	X	X	X	X	(WST)	X	X	X	3
BODMR2	4 S	1/17/95	0935	X	X	X	X	X	X	X	X	X	X			4
BODMT3	5 S	1/17/95	1047	X	X	X	X	X	X	X	X		X	X	X	5
BODMR3	6 S	1/17/95	1047	X	X	X	X	X	X	X	X	X	X			6

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-18-95/0830	ERC [signature] B. Whitten	0830 1-18-95
ERC [signature] B. Whitten	1-18-95 1058	[signature] A. Boyd Quanterra	1-18-95 1050

SPECIAL INSTRUCTIONS

DATA DELIVERABLE-STAND ALONE.
LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET.

*=THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g

BODMT2 - total alpha/beta/gamma provided in 1x500ml and 1x950ml.

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
			SDG W0386

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613019.1538

0000023

OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

RLS 11/7/95

REV. 3 DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY:
1. EXPEDITED RESPONSE ACTION
2. ✓ TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA ✓ RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY ✓ REGULAR ✓ RADCHEM

SAMPLE MATRIX: ✓ SOIL/SEDIMENT WATER VEGETATION OILS
SLUDGE CONCRETE OTHER _____

LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
Quanterra (Main)	Not Applicable	N/A
Lockheed (Split)	Not Applicable	N/A

COMMENTS:

▸▸ Revision 1 — Changes to the EAL bottle requirements.

▸▸ Revision 2 — Change to laboratories.

▸▸ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

▸▸ Data Deliverable — Standalone

▸▸ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

9613492 1500

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

DATE: 01/31/95	LABORATORY: Quanterra
PROJECT TITLE/NO.: 100-D Ponds/B94-098	NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable)

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable)

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples B0DMT2 and B0DMT3 should be reported in one standalone data package. Results for samples B0DMT6, B0DMS9, B0DMR2, B0DMR3, and B0DMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample B0DMT4 should be reported in one standalone data package. Results from samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, and B0DMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith/ _____ 1/31/95
OSM Project Coordinator (Print/Sign Name) Date

M.T. Stankovich/ _____ 2/13/95
Technical Representative (Print/Sign Name) Date

N/A
Quality Assurance (Print/Sign Name) Date

JJ94B

9613497.1541

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-02041-3

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng. Support	Field & Analytical Supp	Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☐ Prepaid ☐ Collect

Shipped to	Off-site Custodian
Company: Quanterra (IT) Address: 2800 Geo Wash Way City: Richland, State: Washington, Zip Code: 99352 Country:	On-site Custodian / Payroll No.

Qty.	Property No.	Description (Include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: B00MT6 B00M59 B00MT2 B00MR2 B00MT3 B00MR3 Cooler ID: SML-457 & ER-41 B00MT5 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		~~Sample #:~~ Cooler ID: Polycooler with groundwater ~~samples~~ packed in wet ice and vermiculite	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☒ Required for Project Work. List Project No. 100-D-PONDS PHASE II

☐ Business Trip Bill of Lading #: W/A

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. N/A

☐ Other (Please specify) Sampling supports RI/FS work in the 100 AREA

RECEIVED

JAN 18 1995

PROPERTY RECORDS

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
[signature]	RARA - 0051	1-18-95

Location of and Contact for Property (Name/Phone No./Bldg./Area)

B.T. Whitten (509) 376-7777

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
1-18-95	ITE 2072 PV3AA	

Originated By	Date	Authorized By	Date
B.T. WHITTEN	1-18-95	[signature]	1-18-95
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		Debbie Rives	1/18/95

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date
~~GO26K~~	

DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

*U.S. GPO: 1994-592-170/00029

54-3000-479 (01/94)

R. Brad Quanterra 1/18/95 1050 000026

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: Westinghouse-Hanford			DATA PACKAGE: ~~W0429~~ SAF-B94-098		
VALIDATOR: S. Chan		LAB: Quanterra		DATE: 3/27/95	
CASE:			SDG: W0429		

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 Soil

B0DMT2, B0DMT3

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . (Yes) No N/A

Is a case narrative present? . . . . . (Yes) No N/A

Comments: _____

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . (Yes) No N/A

Comments: _____

A-1

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

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

Are initial calibrations acceptable? . . . . . (Yes) No N

Are continuing calibrations acceptable? . . . . . (Yes) No N

Comments: _____

4. BLANKS

Were laboratory blanks analyzed? . . . . . (Yes) No N

Are laboratory blank results acceptable? . . . . . Yes (No) N

Were field/trip blanks analyzed? . . . . . Yes No (N)

Are field/trip blank results acceptable? . . . . . Yes No (N)

Comments: Butyl benzyl phthalate: detected: U for both samples.

5. ACCURACY

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

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

Were MS/MSD samples analyzed? . . . . . (Yes) No N

Are MS/MSD results acceptable? . . . . . Yes (No) N

Comments: The MS recovery for pyrene: 51%. No action taken since the recovery was only slightly below limits & MSD recovery was OK, and surrogate recovery was w/in limits

A-2 Dc

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:

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:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

Comments (attach additional sheets as necessary):

MS-pyrene slightly below limits. No qualification necessary since MS raw data looked fine, MSD recovery w/in limits + surrogate recovery w/in limits

Internal std problem for Perylene-d12

BODMT2 } ~~Pery~~ - 38476
BODMT3 } 79564

∴ all associated sample results qualified UJ

ACCURACY DATA SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/27/95	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B0DMT6MS	Pyrene	51	B0DMT2, B0DMT3	None

BLANK AND SAMPLE DATA SUMMARY

SDG: W0429	REVIEWER: SC			DATE: 3/27/95				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
SBLK01	Butylbenzylphthalate	290	J		ug/Kg		2900	B0DMT2	U
SBLK01	Butylbenzylphthalate	290	J		ug/Kg		2900	B0DMT3	U
SBLK01	Aldol Condensate	14000	J	4.62	ug/Kg		140000	B0DMT2	U
SBLK01	Aldol Condensate	14000	J	4.62	ug/Kg		140000	B0DMT3	U

PRECISION DATA SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/27/95	PAGE 1 OF 1		
COMMENTS: No problems.					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER

0000034

961349/ 1549

CALIBRATION DATA SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/27/95		PAGE 1 OF 1	
COMMENTS: All within limits.					
CALIB. TYPE: INITIAL CONTINUING		INSTRUMENT:			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER

HOLDING TIME SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/27/95	PAGE 1 OF 1
COMMENTS: No problems. All within limits			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Pesticide/PCB - Data Package No. W0429-QES (SDG No. W0429)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-QES prepared by Quanterra Environmental Services (QTES). 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 Level	Analysis
B0DMT2	01/17/95	Soil	D	See Note 1
B0DMT3	01/17/95	Soil	D	See Note 1

Note 1. Requested Method: Pesticide/PCB

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualifications
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 <2x 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 >2x 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.

- **Instrument Performance and Calibrations**

Initial Calibrations

The laboratory performed an initial multipoint calibration for all target compounds at the concentrations required by SW-846 protocols. The linearity of the initial calibration is established when the %RSD or the calibration factors are <20%. If the RSD is >20%, all detected results are qualified as estimates and flagged "J", and all nondetects are flagged "UJ".

All initial calibration results were acceptable.

Calibration Verification

The criteria for acceptable continuing calibrations requires that the calibration factors for all target compounds have a percent difference of $\leq$15% of the average calibration factor calculated for the associated initial calibration standard. If the percent difference for the continuing calibration is >15%, all associated results for that compound are qualified as estimates (J for detects, UJ for nondetects).

Continuing calibration results exceeded the 15% QC limit for heptachlor, aldrin, heptachlor epoxide, dieldrin, 4,4-DDE, endrin, endosulfan II, endosulfan sulfate, 4,4-DDT, endrin aldehyde, methoxychlor and DBC in sample numbers B0DMT2 and B0DMT3. All associated samples were qualified as estimates (J for detects, UJ for nondetects).

All other calibration verification results were acceptable.

- **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 >CRQL. If target compounds are present, sample results <5x the blank concentration are qualified as undetected "U". If the sample result is <5x the blank

concentration and <CRQL, the result is qualified as undetected and elevated to the CRQL.

All method 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 analyses are performed in duplicate using six compounds and must be within the established laboratory quality control limits (EPA 1991b). If spike recoveries are outside control limits, detected sample results <5x 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 >5x the spike concentration require no qualification.

All matrix spike 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 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". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Undetected compounds with surrrogate 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 analyzed using SW-846 protocol, results must be within RPD limits of $\pm$35%. If RPD values are out of

specification and the sample concentration is <5x 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 >5x the spike concentration, no qualification is required.

All matrix spike/matrix spike duplicate RPD results were acceptable.

- **System Performance**

Compound Identification

The identitiy of detected compounds are confirmed to investigate the possibility of false positives or false negatives. If the qualitative criteria are not met, detected results are qualified as follows: Misidentified peaks outside the retention time window are reported to the CRQL level if no interferences are noted. If the misidentified peak interferes with a target peak then the reported value is qualified as estimated and undetected "UJ". If detected results have not been analyzed on dissimilar columns, qualify the results as unusable "R".

All compounds were identified correctly.

- **Sample Result Verification and Detection Limits**

The objective of a review of results quantitation and CRQLs is to determine if quantitation was performed accurately, CRQLs were calculated properly and that the project-specific CRQLs were met. Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

All sample results and reported detection limits were acceptable.

- **Completeness**

Data Package No. W0429-QES (SDG No. W0429) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to calibration verification results outside QC limits, twelve compounds in sample numbers B0DMT2 and B0DMT3 were qualified as estimates (J for detects, UJ for nondetects). Data flagged "J" indicate the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1991b, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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 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: W0429	REVIEWER: SC	DATE: 3/28/95	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Heptachlor	UJ	B0DMT2, B0DMT3	Continuing Calibration
Aldrin	J	B0DMT2, B0DMT3	Continuing Calibration
Heptachlor epoxide	UJ	B0DMT2, B0DMT3	Continuing Calibration
Dieldrin	UJ	B0DMT2, B0DMT3	Continuing Calibration
4,4-DDE	UJ	B0DMT2, B0DMT3	Continuing Calibration
Endrin	UJ	B0DMT2, B0DMT3	Continuing Calibration
Endosulfan II	UJ	B0DMT2, B0DMT3	Continuing Calibration
Endosulfan sulfate	UJ	B0DMT2, B0DMT3	Continuing Calibration
4,4-DDT	UJ	B0DMT2, B0DMT3	Continuing Calibration
Endrin aldehyde	UJ	B0DMT2, B0DMT3	Continuing Calibration
Methoxychlor	UJ	B0DMT2, B0DMT3	Continuing Calibration
DBC	UJ	B0DMT2, B0DMT3	Continuing Calibration

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PESTICIDE/PCB ANALYSIS, SOIL MATRIX, (µg/Kg)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: QUANTERRA																					
Case:	SDG: W0429																				
Sample Number		B0DMT2		B0DMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks																					
Sample Date		01/17/95		01/17/95																	
Extraction Date		01/20/95		01/20/95																	
Analysis Date		01/25/95		01/25/95																	
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	1.7	1.8	U	3.1	U																
beta-BHC	1.7	3.5	U	6.2	U																
delta-BHC	1.7	5.3	U	9.3	U																
gamma-BHC (Lindane)	1.7	4.5		4.1	U																
Heptachlor	1.7	1.8	UJ	3.1	UJ																
Aldrin	1.7	8.2	J	36	J																
Heptachlor epoxide	1.7	49	UJ	86	UJ																
Endosulfan I	1.7	8.3	U	14	UJ																
Dieldrin	3.3	1.2	UJ	2.1	UJ																
4,4'-DDE	3.3	25	UJ	82	UJ																
Endrin	3.3	140	UJ	440	UJ																
Endosulfan II	3.3	45	UJ	55	UJ																
4,4'-DDD	3.3	6.5	U	24	U																
Endosulfan sulfate	3.3	39	UJ	68	UJ																
4,4'-DDT	3.3	170	UJ	190	UJ																
Methoxychlor	17.0	100	UJ	180	UJ																
Endrin Aldehyde	3.3	54	UJ	110	UJ																
Tech. Chlordane	1.7	8.3	U	14	U																
Toxaphene	170.0	140	U	250	U																
Arochlor-1221	33.0	59	U	100	U																
Arochlor-1232	67.0	59	U	100	U																
Arochlor-1242/1016	33.0	39	U	68	U																
Arochlor-1248	33.0	59	U	100	U																
Arochlor-1254	33.0	2300		9800																	
Arochlor-1260	33.0	1800		7500																	

RJS 5/3/95

9613497.1563

1D

EPA SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS DATA SHEET

BODMT2

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002

Sample wt/vol: 30.0 (g/ml) g Lab File ID: _____

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 44 dec. _____ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01-25-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q	
319-84-6	alpha-BHC	1.8	U	
319-85-7	beta-BHC	3.5	U	
319-86-8	delta-BHC	5.3	U	
58-89-9	gamma-BHC (Lindane)	4.5		
76-44-8	Heptachlor	1.8	~~U~~	UJ
309-00-2	Aldrin	8.2		
1024-57-3	Heptachlor epoxide	49	~~U~~	UJ
959-98-8	Endosulfan I	8.3	~~U~~	UJ
60-57-1	Dieldrin	1.2	~~U~~	
72-55-9	4,4'-DDE	25	~~UX~~	UJ
72-20-8	Endrin	140	~~UX~~	UJ
33213-65-9	Endosulfan II	45	~~UX~~	UJ
72-54-8	4,4'-DDD	6.5	U	
1031-07-8	Endosulfan sulfate	39	~~U~~	UJ
50-29-3	4,4'-DDT	170	~~UX~~	UJ
72-43-5	Methoxychlor	100	~~U~~	UJ
53494-70-5	Endrin Aldehyde	54	~~UX~~	UJ
57-74-9	Tech. Chlordane	8.3	U	
8001-35-2	Toxaphene	140	U	
11104-28-2	Aroclor-1221	59	U	
11141-28-2	Aroclor-1232	59	U	
53469-21-9/12674-11-2	Aroclor-1242/1016	39	U	
12672-29-6	Aroclor-1248	59	U	
11097-57-4	Aroclor-1254		SD	
11096-82-5	Aroclor-1260		SD	

U: Concentration of analyte is less than the value given.
SD: See dilution
X: Elevated detection limit due to PCB interference.

RS 4/30/

FORM I PEST 1/87 Rev.

~~0077~~

9613497.1564

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT2DL

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-002DL

Sample wt/vol: 30.0 (g/ml) g Lab File ID: _____

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 44 dec. _____ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02-02-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 10

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
11104-28-2	Aroclor-1221	590	U
11141-28-2	Aroclor-1232	590	U
53469-21-9/12674-11-2	Aroclor-1242/1016	390	U
12672-29-6	Aroclor-1248	590	U
11097-57-4	Aroclor-1254	2300	
11096-82-5	Aroclor-1260	1800	

U: Concentration of analyte is less than the value given.

RS 4/30/95

FORM I PEST 1/87 Rev.

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9613497.1565 1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT3

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004

Sample wt/vol: 30.0 (g/ml) g Lab File ID: .

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 68 dec. _____ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01-25-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 1

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q	
319-84-6	alpha-BHC	3.1	U	
319-85-7	beta-BHC	6.2	U	
319-86-8	delta-BHC	9.3	U	
58-89-9	gamma-BHC (Lindane)	4.1	U	
76-44-8	Heptachlor	3.1	U	UJ
309-00-2	Aldrin	36		UJ
1024-57-3	Heptachlor epoxide	86	U	UJ
959-98-8	Endosulfan I	14	U	
60-57-1	Dieldrin	2.1	U	UJ
72-55-9	4,4'-DDE	82	UX	UJ
72-20-8	Endrin	440	UX	UJ
33213-65-9	Endosulfan II	55	UX	
72-54-8	4,4'-DDD	24	UX	
1031-07-8	Endosulfan sulfate	68	U	UJ
50-29-3	4,4'-DDT	190	UX	UJ
72-43-5	Methoxychlor	180	U	UJ
53494-70-5	Endrin Aldehyde	110	UX	UJ
57-74-9	Tech. Chlordane	14	U	
8001-35-2	Toxaphene	250	U	
11104-28-2	Aroclor-1221	100	U	
11141-28-2	Aroclor-1232	100	U	
53469-21-9/12674-11-2	Aroclor-1242/1016	68	U	
12672-29-6	Aroclor-1248	100	U	
11097-57-4	Aroclor-1254		SD	
11096-82-5	Aroclor-1260		SD	

U: Concentration of analyte is less than the value given.
SD: See dilution
X: Elevated detection limit due to PCB interference.

4/30/95

FORM I PEST 1/87 Rev.

9613497.1566 1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT3DL

Lab Name: QUANTERRA,MO Contract: 550.56

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W0429

Matrix: (soil/water) SOIL Lab Sample ID: 7344-004DL

Sample wt/vol: 30.0 (g/ml) g Lab File ID: _____

Level: (low/med) LOW Date Sampled : 01-17-95

% Moisture: not dec. 68 dec. _____ Date Extracted: 01-20-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 01-24-95

GPC Cleanup: (Y/N) N pH: _____ Dilution Factor: 25

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/Kg	Q
319-84-6	alpha-BHC	77	U
319-85-7	beta-BHC	150	U
319-86-8	delta-BHC	230	U
58-89-9	gamma-BHC (Lindane)	100	U
76-44-8	Heptachlor	77	U
309-00-2	Aldrin	100	U
1024-57-3	Heptachlor epoxide	2100	U
959-98-8	Endosulfan I	360	U
60-57-1	Dieldrin	52	U
72-55-9	4,4'-DDE	100	U
72-20-8	Endrin	780	UX
33213-65-9	Endosulfan II	100	U
72-54-8	4,4'-DDD	280	U
1031-07-8	Endosulfan sulfate	1700	U
50-29-3	4,4'-DDT	340	UX
72-43-5	Methoxychlor	4500	U
53494-70-5	Endrin Aldehyde	590	U
57-74-9	Tech. Chlordane	360	U
8001-35-2	Toxaphene	6200	U
11104-28-2	Aroclor-1221	2600	U
11141-28-2	Aroclor-1232	2600	U
53469-21-9/12674-11-2	Aroclor-1242/1016	1700	U
12672-29-6	Aroclor-1248	2600	U
11097-57-4	Aroclor-1254	9800	
11096-82-5	Aroclor-1260	7500	

U: Concentration of analyte is less than the value given.
X: Elevated detection limit is due to PCB interference.

RS 4/30/95

FORM I PEST 1/87 Rev.

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
P.O. Box 1970
Richland, Washington 99352

March 1, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 18, 1995
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W0429
Data Deliverable	:	Standalone

I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7344-002	B0DMT2	50132203	Soil	01/18/95
7344-004	B0DMT3	50132205	Soil	01/18/95

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Quanterra
Environmental Services

Analyses requested: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 is included in this SDG to meet requirements.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike

V. Comments

Samples arrived in St. Louis at 0°C which is not within the recommended 4°C ± 2°C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See ROD-B95-013.

Sample 7344-001 is included in this package only for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.

Quanterra
Environmental
Services

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Abby Dolden for Wade Price

Wade H. Price
Project Manager
e:\\sqmlo01\priceS\abbydave\hanford\hanw0429.nar

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

1-17-95 WST

Page 1 of 12

Data Turnaround: ☐ Priority ☒ Normal — WST 1-17-95

Collector: ~~Dave~~ St. John, Doug Bowers/Dee Wendy Thompson	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: SML 457 and ER 14	Field Logbook No.:	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.:	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks:		

	A	B	C	D	E	F	G	H							
Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	Cool 4°	COOL 4	Cool 4°				
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	G	G			
No. of Container(s)	1	1	1	1	1	1	1	1	3	1	1	1			
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	500ml	950ml			
SAMPLE ANALYSIS	ICP METALS-TAL/AA MATALS (As, Pb, Se, Tl)	VOA-TCL	SEMI-VOA-TCL	PCB/PEST	SULFIDE	TOX	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3)	NO2-NO3	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	Total alpha beta Gamma Spec	total alpha beta gamma Spec	501323		

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

501322

Sample No.	Matrix*	Date Sampled	Time Sampled													
WST 1-17-95 ~~BODMR4~~ BODMT6	SO	1/17/95	0902	X	X	X	X	X	X	X	X	X	X	X	X	01
BODMS9	SE	1/17/95	0907	X			X	X				X	X	X	X	2
BODMT2	SE	1/17/95	0935	X	X	X	X	X	X	X	X	X	X	X	X	3
BODMR2	SE	1/17/95	0935	X	X	X	X	X	X	X	X	X				4
BODMT3	SE	1/17/95	1047	X	X	X	X	X	X	X	X		X	X	X	5
BODMR3	SE	1/17/95	1047	X	X	X	X	X	X	X	X	X	X			6

CHAIN OF POSSESSION	Sign/Print Names	Date/Time
Relinquished By	Doug Bowers	1-18-95/0830
Received By	ERC Kim Whitten B. Whitten	0830 1-18-95
Relinquished By	ERC Kim Whitten B. Whitten	1058 1-18-95
Received By	R. Boyd Quinton	1-18-95 1058
Relinquished By		
Received By		
Relinquished By		
Received By		

SPECIAL INSTRUCTIONS

DATA DELIVERABLE-STAND ALONE.
LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET.

*=THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g

BODMT2 - total alpha/beta/gamma provided in 1x500ml and 1x950ml.

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: SDG W0386
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

0 0 0 0 2 1

0 1 0 2 0 . 1 5 2

OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

RCS 1/17/95

REV. 3 . DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY:
1. EXPEDITED RESPONSE ACTION
2. ✓ TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA ✓ RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY ✓ REGULAR ✓ RADCHEM

SAMPLE MATRIX: ✓ SOIL/SEDIMENT WATER VEGETATION OILS
SLUDGE CONCRETE OTHER _____

LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
Quanterra (Main)	Not Applicable	N/A
Lockheed (Split)	Not Applicable	N/A

COMMENTS:

▸▸ Revision 1 — Changes to the EAL bottle requirements.

▸▸ Revision 2 — Change to laboratories.

▸▸ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

▸▸ Data Deliverable — Standalone

▸▸ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

~~PAGE 1 OF 4~~

961349.1574

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

DATE: 01/31/95	LABORATORY: Quanterra
PROJECT TITLE/NO.: 100-D Ponds/B94-098	NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable)

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable)

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples B0DMT2 and B0DMT3 should be reported in one standalone data package. Results for samples B0DMT6, B0DMS9, B0DMR2, B0DMR3, and B0DMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample B0DMT4 should be reported in one standalone data package. Results from samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, and B0DMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith/ _____ 1/31/95
OSM Project Coordinator (Print/Sign Name) Date

M.T. Stankovich/ _____ 2/13/95
Technical Representative (Print/Sign Name) Date

N/A
Quality Assurance (Print/Sign Name) Date

9613497.1575

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-02041-3

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng. Support	Field & Analytical Supp	Field Sampling

The following items are to be shipped from: [X] Contractor [ ] Vendor

Routing: [ ] Prepaid [ ] Collect

Shipped to	Off-site Custodian
Company: Quanterra (IT) Address: 2800 Geo Wash Way City: Richland, State: Washington, Zip Code: 99352 Country:	On-site Custodian / Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: B0DMT6 B0DMS9 B0DMT2 B0DMR2 B0DMT3 B0DMR3 Cooler ID: SML-457 & ER-41 B0DMT5 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		Sample #: Cooler ID: Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

[ ] Classified [X] Unclassified [ ] Shipped Under DOE Contract [ ] Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

[X] Required for Project Work. List Project No. 100-D-PONDS PHASE II

[ ] Business Trip — Bill of Lading #: N/A

[ ] Off-site Assignment

[ ] Shipment to Subcontractor. List Subcontract No. N/A

[ ] Other (Please specify) Sampling supports RI/FS work in the 100 AREA

RECEIVED

JAN 18 1995

PROPERTY RECORDS

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
[signature]	RARA - 0051	1-18-95

Location of and Contact for Property (Name/Phone No./Bldg./Area)

B.T. Whitten (509) 376-7777

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
1-18-95	ITE 2072 PV3AA	

Originated By	Date	Authorized By	Date
B.T. WHITTEN	1-18-95	[signature]	1-18-95
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		Debbie Rives	1/18/95

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date
~~0028~~	

DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

*U.S. GPO: 1994-592-170/00029

[signature] 1/18/95 1050

000024

54-3000-479 (01/94)

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: WHC			DATA PACKAGE: SAF-B94-098		
VALIDATOR: S. Chari		LAB: Quanterra		DATE: 3/28/95	
CASE: V34402			SDG: W0429		
ANALYSES PERFORMED					
☐ CLP3/90	☐ SW-846 8080	☐ SW-846 8081	☐	☐	☐
SAMPLES/MATRIX					

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: _____

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

A-5 pr

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: SC 3/25/95

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: See %D on WP tables

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

A-6/SC

PESTICIDE/PCB DATA VALIDATION CHECKLIST

re retention times acceptable in the PEMs, INDA and INDB mixes?	Yes	No	N/A
re RPD values in the PEMs acceptable?	Yes	No	N/A
re the DDT and endrin breakdowns acceptable?	Yes	No	N/A
as GPC cleanup performed?	Yes	No	N/A
s the GPC calibration check acceptable?	Yes	No	N/A
as Florisil cleanup performed?	Yes	No	N/A
s the Florisil performance check acceptable?	Yes	No	N/A

omments:

. BLANKS

ere laboratory blanks analyzed?	Yes	No	N/A
re laboratory blank results acceptable?	Yes	No	N/A
ere field/trip blanks analyzed?	Yes	No	N/A
re field/trip blank results acceptable?	Yes	No	N/A

omments:

. ACCURACY

ere surrogates analyzed?	Yes	No	N/A
re surrogate recoveries acceptable?	Yes	No	N/A
ere MS/MSD samples analyzed?	Yes	No	N/A
re MS/MSD results acceptable?	Yes	No	N/A
ere LCS samples analyzed?	Yes	No	N/A
re LCS results acceptable?	Yes	No	N/A

omments:

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:

A-8 BC

PESTICIDE/PCB DATA VALIDATION CHECKLIST

Comments:

Note: The Aroclor 1242/1016 RT - Standards & on Form IX : Shld
The RTW should be reported as 2.V 3.65 - 3.77 not 2.77 as reported in Form IX (pages 581, 582)

A-9 B/C

CALIBRATION DATA SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/28/95		PAGE 1 OF 1	
COMMENTS:					
CALIB. TYPE:	INITIAL CONTINUING	INSTRUMENT:			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
1/25/95	Heptachlor		16	B0DMT2, B0DMT3	UJ
1/25/95	Aldrin		19	B0DMT2, B0DMT3	J
1/25/95	Heptachlor epoxide		19	B0DMT2, B0DMT3	UJ
1/25/95	Dieldrin		20	B0DMT2, B0DMT3	UJ
1/25/95	4,4-DDE		17	B0DMT2, B0DMT3	UJ
1/25/95	Endrin		24	B0DMT2, B0DMT3	UJ
1/25/95	Endosulfan II		26	B0DMT2, B0DMT3	UJ
1/25/95	Endosulfan sulfate		20	B0DMT2, B0DMT3	UJ
1/25/95	4,4-DDT		17	B0DMT2, B0DMT3	UJ
1/25/95	Endrin aldehyde		19	B0DMT2, B0DMT3	UJ
1/25/95	DBC		17	B0DMT2, B0DMT3	UJ
1/25/95	4,4-DDE		16	B0DMT2, B0DMT3	UJ
1/25/95	4,4-DDT		30	B0DMT2, B0DMT3	UJ
1/25/95	Methoxychlor		23	B0DMT2, B0DMT3	UJ

BLANK AND SAMPLE DATA SUMMARY

SDG: W0429	REVIEWER: SC			DATE: 3/28/95				PAGE 1 OF 1	
COMMENTS: No problems.									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER

ACCURACY DATA SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/28/95	PAGE 1 OF 1	
COMMENTS: No problems.				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED

PRECISION DATA SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/28/95		PAGE 1 OF 1	
COMMENTS: No problems.					
COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER

HOLDING TIME SUMMARY

SDG: W0429	REVIEWER: SC			DATE: 3/28/95		PAGE 1 OF 1	
COMMENTS: No problems. All within limits							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER

96134971 1586

0000035

9613497.1507

RECORD COPY

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Inorganics - Data Package No. W0429-QES (SDG No. W0429)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-QES prepared by Quanterra Environmental Services (QTES). 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 Level	Analysis
B0DMT2	01/17/95	Soil	D	See Note 1
B0DMT3	01/17/95	Soil	D	See Note 1

Note 1. Requested Method: SW-846/ICP Metals, SW-846/GFAA Metals

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualifications
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 ICP metals and GFAA metals analyses were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Samples must be analyzed within six months for all metals.

  Holding time requirements for all analytes were met.

- **Blanks**

Calibration Blanks

A calibration blank must be analyzed immediately after every initial and continuing calibration verification. The blank must be analyzed at the beginning of the run and after the last analytical sample. In the case of positive blank results, samples with digestate concentrations (in ug/L) of $<5x$ the highest amount found in any of the associated blanks have had their associated values qualified as non-detected and flagged "U". Samples with concentrations $>5x$ the highest blank value do not require qualification.

In the case of negative calibration blank results, if the absolute value of any calibration blank exceeds the Instrument Detection Limit (IDL), all non-detects are qualified as estimates and flagged "UJ", and all positive results within two times (2x) the absolute value of the blank result are qualified as estimates and flagged "J". The qualification is applied only to results generated between the calibration blank IDL and the nearest acceptable blank.

All calibration blank results were acceptable.

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) of $<5x$ the preparation blank value have had their associated values qualified as non-detects and flagged "U". Samples with concentrations $>5x$ 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 non-detects are rejected and flagged "UR" and all detects that are $<10x$ 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 $>$IDL and $\leq$CRDL, all non-detects are qualified as estimates and flagged "UJ" and all detects $<10x$ the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are $>10x$ the absolute value of the preparation blank, no qualification is necessary.

All preparation blanks 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 <30% and a sample value below the IDL were rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result <IDL are qualified "UJ". Samples with a spike recovery of >125% or <75% and a sample result >IDL are qualified "J". Finally, all samples with a spike recovery >125% and a sample result <IDL, no qualification is required.

  All matrix spike recovery results were acceptable.

  Laboratory Control Sample Recovery

  The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be digested or distilled and analyzed with every group of samples which have been prepared together. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

  One liquid LCS was digested and analyzed for each sample batch in this report that contained water samples.

  All LCS results were found to be acceptable.

- **Precision**

  Laboratory Duplicate Samples

  The laboratory duplicate result measures the precision of the method by measuring a second aliquot of the sample that is treated the same way as the original. Samples whose precision fell outside the quality control requirements were qualified as estimates and flagged "J".

  All laboratory duplicate recovery results were acceptable.

ICP Serial Dilution

The ICP serial dilution is used to determine whether significant physical or chemical interferences exist due to the sample matrix. If the sample concentration is $\geq$50x IDL for an analyte and the %D is outside the control limits (>10%), the associated data must be qualified as estimated "J".

No ICP serial dilution was analyzed with this SDG. No data was qualified since SW-846 methods do not require dilution analysis unless sample concentrations are greater than the linear range of the instrument.

- **Furnace AA Quality Control**

The post-digestion analytical spike is analyzed to determine the extent of interference in the digestate matrix. When the result of the analytical spike analysis exceeds the control window of 85% to 115% recovery and the absorbance of the sample is >50% of the analytical spike absorbance, then the sample must be reanalyzed using the MSA. The duplicate injections and the analytical spike recoveries establish the precision and accuracy of the individual GFAA determinations.

Duplicate Injections

Each furnace analysis requires a minimum of two injections (burns), except for full MSA. For concentrations >CRDL, the duplicate injection readings must agree within 20% RSD or CV. If these requirements are not met, the analytical sample must be rerun once (i.e., two additional burns). If the readings are then still outside the QC limits, the result is qualified as an estimate and flagged "J".

All duplicate injection quality control requirements were met.

Analytical Spike Recoveries

For all samples whose analytical spike results are outside the 85% to 115% control limit, but whose absorbances are <50% of the analytical spike absorbance, the samples were qualified as estimates and flagged "J". In cases where the analytical spike recovery was <10%, non-detect results were rejected and flagged "UR".

No analytical spike results were determined for this SDG. No qualification of data was necessary since GFAA analytical spikes are not required by SW-846 validation guidelines.

- **Sample Result Verification and Detection Limits**

  Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors.

  The reviewer verified that the results and detection limits fell within the linear range of the instrument. All sample results and reported detection limits were acceptable.

- **Completeness**

  Data Package No. W0429-QES (SDG No. W0429) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1988c, *EPA Contract Laboratory Program Statement of Work for Inorganics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1988d, *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1990, *EPA Contract Laboratory Program Statement of Work for Inorganic Analyses, Multi-media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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 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. 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 (usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W0429	REVIEWER: RJS	DATE: 4/4/95	PAGE 1 OF 1
COMMENTS: No Data Qualified			
COMPOUND	QUALIFIERS	SAMPLES AFFECTED	REASON

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, SOIL MATRIX, (mg/kg)

Project: WESTINGHOUSE–HANFORD																					
Laboratory: Quanterra																					
Case	SDG: W0429																				
Sample Number		B0DMT2		B0DMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks	MG/KG	Soil		Soil																	
Sample Date		01/17/95		01/17/95																	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	20	53700		63400																	
Antimony	10	7.8		10.1	U																
Arsenic	1	14.4		41.1																	
Barium	20	74.3		107																	
Beryllium	0.7	0.59		0.76																	
Cadmium	2	2.6		4.7																	
Calcium	500	3630		4200																	
Chromium	2	66.4		77.1																	
Cobalt	5	7.3		9.4																	
Copper	2.5	68.6		55.8																	
Iron	10	20100		21000																	
Lead	0.3	104		197																	
Magnesium	500	3090		4180																	
Manganese	1.5	140		201																	
Nickel	4	14.7		18.8																	
Potassium	500	654		970																	
Selenium	0.5	0.18	U	0.31	U																
Silver	20	0.76		1.3																	
Sodium	100	244		286																	
Thallium	1	0.28		0.32																	
Vanadium	5	45.0		46.5																	
Zinc	2	450		1030																	

000012

5/3/95

FIL = Filtered, NA = Not Analyzed, N/A = Not Applicable

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0DMT2

Lab Name: ITAS_ST._LOUIS Contract: 550.56

Lab Code: ITMO Case No.: SAS No.: SDG No.: W0429

Matrix (soil/water): SOIL Lab Sample ID: 7344-002

Level (low/med): LOW Date Received: 01/18/95

% Solids: 56.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	53700			P
7440-36-0	Antimony	7.8	B		P
7440-38-2	Arsenic	14.4	B		F
7440-39-3	Barium	74.3			P
7440-41-7	Beryllium	0.59	B		P
7440-43-9	Cadmium	2.6	B		P
7440-70-2	Calcium	3630			P
7440-47-3	Chromium	66.4			P
7440-48-4	Cobalt	7.3	B		P
7440-50-8	Copper	68.6			P
7439-89-6	Iron	20100			P
7439-92-1	Lead	104			P
7439-95-4	Magnesium	3090			P
7439-96-5	Manganese	140			P
7440-02-0	Nickel	14.7			P
7440-09-7	Potassium	654	B		P
7782-49-2	Selenium	0.18	U		F
7440-22-4	Silver	0.76	B		P
7440-23-5	Sodium	244			P
7440-28-0	Thallium	0.28	B		F
7440-62-2	Vanadium	45.0			P
7440-66-6	Zinc	450			P

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

4/24/95

FORM I - IN

RJS SW-846

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U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0DMT3

Lab Name: ITAS_ST._LOUIS_____ Contract: 550.56____

Lab Code: ITMO__ Case No.:_____ SAS No.:_____ SDG No.: W0429_____

Matrix (soil/water): SOIL_ Lab Sample ID: 7344-004

Level (low/med): LOW__ Date Received: 01/18/95

% Solids: _32.3

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	63400			P
7440-36-0	Antimony	10.1	U		P
7440-38-2	Arsenic	41.1			F
7440-39-3	Barium	107			P
7440-41-7	Beryllium	0.76	B		P
7440-43-9	Cadmium	4.7	B		P
7440-70-2	Calcium	4200			P
7440-47-3	Chromium	77.1			P
7440-48-4	Cobalt	9.4	B		P
7440-50-8	Copper	55.8			P
7439-89-6	Iron	21000			P
7439-92-1	Lead	197			P
7439-95-4	Magnesium	4180			P
7439-96-5	Manganese	201			P
7440-02-0	Nickel	18.8			P
7440-09-7	Potassium	970	B		P
7782-49-2	Selenium	0.31	U		F
7440-22-4	Silver	1.3	B		P
7440-23-5	Sodium	286	B		P
7440-28-0	Thallium	0.32	B		F
7440-62-2	Vanadium	46.5			P
7440-66-6	Zinc	1030			P

Color Before: _____ Clarity Before: _____ Texture: _____

Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

RJS 4/24/95

FORM I - IN

SW-846

000014

00956

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
P.O. Box 1970
Richland, Washington 99352

March 1, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 18, 1995
Number of Samples	:	Two (2)
Sample Type	:	Soil
SDG Number	:	W0429
Data Deliverable	:	Standalone

I. Introduction

On January 18, 1995, two (2) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt. the samples were given the following laboratory ID numbers to correspond with the specific client ID's:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7344-002	B0DMT2	50132203	Soil	01/18/95
7344-004	B0DMT3	50132205	Soil	01/18/95

II. Analytical Results/ Methodology

The analytical results for this report are presented by analytical test. Each set of data includes sample identification information, analytical results and the appropriate detection limits.

Quanterra
Environmental Services

Analyses requested: Volatiles by EPA method 8240. BNA's by EPA method 8270. Pest/PCB by EPA method 8080. ICP by EPA method 6010. Arsenic by EPA method 7060. Lead by EPA method 7421. Selenium by EPA method 7740. Thallium by EPA method 7841. Chloride, Fluoride, Nitrate, Nitrite, Phosphate and Sulfate by EPA method 300.0. Nitrate/Nitrite by EPA method 353.1. TOX by EPA method 9020. Sulfide by EPA method 9030.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0386 after analysis had been done, therefore QC done on the samples in SDG W0386 is included in this SDG to meet requirements.

IV. Definitions

The following codes are used to denote laboratory quality control samples and can be found in the data summary section of this report:

QCBLK- Quality Control Blank, Method Blank
QCLCS- Quality Control Laboratory Control Sample, Blank Spike

V. Comments

Samples arrived in St. Louis at 0°C which is not within the recommended 4°C ± 2°C.

Samples B0DMT6, B0DMS9, B0DMR2, B0CMR3, and B0DMT5 were reported in SDG W0386 as a summary package. Samples, B0DMT2 and B0DMT3, are included in SDG W0429 as a standalone package. See ROD-B95-013.

Quanterra
Environmental Services

Sample 7344-001 is included in this package only for the purpose of verifying QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the analysis of the Volatiles for these samples.

Samples 7344-002 and -004 gave low responses for perylene-d12 internal standard per the CLP SOW criteria. Method 8270 does not require re-analysis for this criteria.

The daily calibration on 01-24-95 for Aroclor 1221 was above the specified 15 percent difference. However, there were no hits for the Aroclor 1221 so the data is reported as is. The continuing calibration in the same sequence for DDE, DDT, Endosulfate and Heptachlor were above the specified 15 percent difference. Again, there were no hits for these compounds and the data is reported as determined in this analytical run.

The "X" flag is used for the Pesticide/PCB analysis when there are elevated detection limits due to PCB interferences.

All samples were originally logged in for Lead analysis by Graphite Furnace but the samples in this SDG had Lead concentrations high enough to be reported from the ICP analysis (concentrations were greater than five times the ICP Lead IDL). The Matrix Spike and Matrix Spike Duplicate data for Lead was analyzed and reported by both Graphite Furnace and ICP.

The Relative Percent Difference could not be calculated for the Nitrate/Nitrite analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the Sulfide analysis due to values being below the detection limits.

The Relative Percent Difference could not be calculated for the TOX analysis due to values being below the detection limits.

Quanterra
Environmental Services

I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Abby Weldon for Wade Price

Wade H. Price
Project Manager
e:\\sqtmlo01\price$\abbydave\hanford\hanw0429.nar

Westinghouse Hanford Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	Page 1 of ~~1~~ 2
	1-17-95 WST	Data Turnaround: [ ] Priorty [X] Normal — WST 1-17-95

Collector: Dave St. John, Doug Bowers ~~Dav~~ Wendy Thompson	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: SML 457 and ER 14	Field Logbook No.	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.	Bill of Lading/Air Bill No.: N/A

Possible Sample Hazards/Remarks

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

	A	B	C	D	E	F	G	H					
Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	Cool 4°	COOL 4	Cool 4°		
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	G	G	
No. of Container(s)	1	1	1	1	1	1	1	1	3	1	1	1	
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	500ml	950ml	
SAMPLE ANALYSIS 501322	ICP METALS-TAL/AA MATALS (As,Pb,Se,Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F,Cl,SO4,PO4,NO2,NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	Total alpha beta Gamma Spec	total alpha beta gamma Spec	501323

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	Total Alpha/Beta, GEA	Activity Scan	Total alpha beta gamma 500ml	Total alpha beta gamma 950ml	
~~BODMR4~~ WST 1-17-95 BODMT6	1 S	1/17/95	0902	X	X	X	X	X	X	X	X	X WST 1-17-95	X	X	X	01
BODMS9	2 S	1/17/95	0907	X A			X B	X C				WST	X	X	X	2
BODMT2	3 S	1/17/95	0935	X	X	X	X	X	X	X	X	X	X	X	X	3
BODMR2	4 S	1/17/95	0935	X	X	X	X	X	X	X	X	X	X			4
BODMT3	5 S	1/17/95	1047	X	X	X	X	X	X	X	X		X	X	X	5
BODMR3	6 S	1/17/95	1047	X	X	X	X	X	X	X	X	X	X			6

B0002

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
Doug Bowers	1-18-95/0830	ERC Rick Whitten B. Whitten	0830 1-18-95
ERC Rick Whitten B. Whitten	1-18-95 1058	A. Boyd Quanterra	1-18-95 1050
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

DATA DELIVERABLE-STAND ALONE.
LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET.

*=THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g

BODMT2 - total alpha/beta/gamma provided in 1x500ml and 1x950ml.

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
			SDG W0386
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613545.1606

OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

RCS 1/17/95

REV. 3 . DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY:
1. EXPEDITED RESPONSE ACTION
2. ✓ TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA ✓ RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY ✓ REGULAR ✓ RADCHEM

SAMPLE MATRIX: ✓ SOIL/SEDIMENT WATER VEGETATION OILS
SLUDGE CONCRETE OTHER _____

LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
Quanterra (Main)	Not Applicable	N/A
Lockheed (Split)	Not Applicable	N/A

COMMENTS:

►► Revision 1 — Changes to the EAL bottle requirements.

►► Revision 2 — Change to laboratories.

►► Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

►► Data Deliverable — Standalone

►► Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

9613497.1608

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

DATE: 01/31/95	LABORATORY: Quanterra
PROJECT TITLE/NO.: 100-D Ponds/B94-098	NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable)

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable)

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples B0DMT2 and B0DMT3 should be reported in one standalone data package. Results for samples B0DMT6, B0DMS9, B0DMR2, B0DMR3, and B0DMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample B0DMT4 should be reported in one standalone data package. Results from samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, and B0DMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith/ _____ 1/31/95
OSM Project Coordinator (Print/Sign Name) Date

M.T. Stankovich/ _____ 2/13/95
Technical Representative (Print/Sign Name) Date

N/A
Quality Assurance (Print/Sign Name) Date

9613497.1609

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-02041-3

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng. Support	Field & Analytical Supp	Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☐ Prepaid ☐ Collect

Shipped to	Off-site Custodian
Company: Quanterra (IT) Address: 2800 Geo Wash Way City: Richland, State: Washington, Zip Code: 99352 Country:	On-site Custodian / Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: B0DMT6 B0DMS9 B0DMT2 B0DMR2 B0DMT3 B0DMR3 Cooler ID: SML-457 & ER41 B0DMT5 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		Sample #: Cooler ID: Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☒ Required for Project Work. List Project No. 100-D-PONDS PHASE II

☐ Business Trip — Bill of Lading #: N/A

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. N/A

☐ Other (Please specify) Sampling supports RI/FS work in the 100 AREA

RECEIVED
JAN 18 1995
PROPERTY RECORDS

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
[signature]	RARA - 0051	1-18-95

Location of and Contact for Property (Name/Phone No./Bldg./Area)

B.T. Whitten (509) 376-7777

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
1-18-95	ITE 2072 PV3AA	

Originated By	Date	Authorized By	Date
B.T. WHITTEN	1-18-95	[signature]	1-18-95
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		Debbie Rives	1/18/95

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date
~~GO 2B~~	

DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

*U.S. GPO: 1994-592-170/00029

R. Brad Quanterra 1/18/95 1050

000023

54-3000-479 (01/94)

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: WHC/BHI			DATA PACKAGE: W0429-QES		
VALIDATOR: RJS		LAB: Quanterra		DATE: 3/24/95	
CASE: 100-DR-1		D-Ponds	SDG: W0429		

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

SAMPLES/MATRIX B0DMT2 (soil)
B0DMT3

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:

Metals < 6 months ✓

A-19[illegible]

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: _____

5. ACCURACY

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

Comments: _____

A-2 B

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:

* No ICP Serial Dilution analysis with SDG, ~~therefore all results for all analytes are qualified as estimated and flagged (J, UJ, RJ).~~ * NO qualification of data since SW-846 methods do not require dilution analysis unless sample concentration are greater than the linear Range 4/24/95 RS

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:

NO GFAA Analytical Spike. No action taken since SW-846 AA criteria references lab specific QAPjP or contract SOW - which do not require a GFAA spike.

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:

A-21/BC

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 D-Ponds Phase II Sampling
Subject: Radiochemistry - Data Package No. W0429-QES (SDG No. W0429)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0429-QES prepared by Quanterra Environmental Services (QTES). 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 Level	Analysis
B0DMT2	01/17/95	Soil	D	See Note 1
B0DMT3	01/17/95	Soil	D	See Note 1

Note 1. Requested Method: Gross Alpha/Beta and Gamma Spectropcopy

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualifications
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 and Sample Preparation**

  Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analyses is six months.

  All holding times and sample preparation measures were acceptable.

- **Instrument Calibration and Performance**

  Instrument calibration is performed to establish that the counters used to determine radionuclide activities are capable of producing acceptable and reliable analytical data. Each counting system must be factory calibrated at installation and after any maintenance or repair. Calibration consists of an instrument efficiency determination for each applicable radionuclide. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible.

  All calibration results, including efficiency checks and background counts, were acceptable.

- **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 were applied: All positive sample results less than five times the highest blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the highest blank concentration were not qualified.

  All blank results were acceptable.

  Field Blanks

  SDG No. W0429-QES contained no field blanks.

- **Accuracy**

  Accuracy is evaluated by analyzing distilled water 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 percent, while that for a matrix spike is 60 to 140 percent. Spike sample results outside the above ranges results in associated sample results being qualified as estimated, rejected, or not qualified, depending on the activity of the individual sample. A chemical tracer is used to determine the efficiency of the analytical method, with tracer yield limits of 30 to 105 percent for strontium-90 and technetium-99. Sample results above the MDA with chemical yields outside the above stated limits were qualified as estimated or rejected.

  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. When the laboratory has not performed duplicate spike analyses, 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 $<$5xCRDL, a control limit of $\leq$2xCRDL is used for soil samples and $\leq$CRDL for water samples. If either the original or replicate value is below the CRDL, the applicable control limits are $\leq$CRDL for water samples and $\leq$2xCRDL for soil samples. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects or estimated non-detects.

  Radium-228 results for all samples were qualified as estimates and flagged "J" due to the lack of a duplicate analysis.

  Uranium-238 results for all samples were qualified as estimates and flagged "J" due to a RPD of 39%.

  All other precision results were acceptable.

- **Sample Result Verification and Detection Limits**

  Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. Minimum Detectable Activities (MDA) for each analyte were assessed to ensure that they met the contract required dectection levels (CRDL).

  The reviewer verified that the results and detection limits fell within the linear range of the instrument. The MDA for Eu-154 and Fe-59 exceeded the CRDL. In accordance with WHC guidelines, no qualification was required.

  All sample results were acceptable.

- **Completeness**

  Data Package No. W0429-QES (SDG No. W0429) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES.

All Ra-228 sample results were qualified as estimates and flagged "J" due to the lack of a duplicate analysis.

REFERENCES

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

WHC, 1992b, *Data Validation Procedures for Radiochemical Analyses*, WHC-SD-EN-001, Rev. 1, Westinghouse Hanford Company, 1993.

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 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. 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: W0429	REVIEWER: RBC	DATE: 14/04/95	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Radium-228	J	B0DMT2, B0DMT3	No Duplicate
Uranium-238	J	BODMT2, BODMT3	RPD 38.7%

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (pCi/g + – 2 standard deviations)

Project: WESTINGHOUSE–HANFORD																					
Laboratory: QES																					
Case	SDG: W0429																				
Sample Number		B0DMT2		BODMT3																	
Location		Test Pit #2		Test Pit #2																	
Remarks	pCi/g	Soil		Soil																	
Sample Date		01/17/95		01/17/95																	
Radiochemistry Analysis		Result	Q		Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha		9.95		25.0																	
Gross Beta		20.6		21.1																	
Cobalt–58		0.0165	U	0.0143	U																
Cobalt–60		0.929		2.43																	
Cesium–137DA		2.72		3.09																	
Europium–152		1.55		1.96																	
Europium–154		0.331		0.46																	
Europium–155		0.0790	U	0.112	U																
Iron–59		–0.0454	U	–0.0669	U																
Potassium–40		9.57		6.77																	
Radium–224DA		0.863		1.05																	
Radium–226DA		0.813		0.801																	
Radium–228DA		0.721	J	1.51	J																
Uranium–238DLP		2.76	J	5.90	J																

RJS 5/3/95

Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	**SDG:**	W0429
LAB SAMPLE ID:	50132303	**MATRIX:**	SOIL
CLIENT ID:	B0DMT2	**DATE RECEIVED:**	1/18/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
CO-58	1.65E-02 U	2.6E-02	2.6E-02	4.42E-02	pCi/g	N/A	RD3219
CO-60	9.29E-01	6.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219
CS-137DA	2.72E+00	7.0E-02	2.8E-01	N/A	pCi/g	N/A	RD3219
EU-152	1.55E+00	1.2E-01	1.9E-01	N/A	pCi/g	N/A	RD3219
EU-154	3.31E-01	6.6E-02	7.4E-02	1.36E-01	pCi/g	N/A	RD3219
EU-155	7.90E-02 U	5.9E-02	6.0E-02	8.92E-02	pCi/g	N/A	RD3219
FE-59	-4.54E-02 U	6.8E-02	6.8E-02	1.07E-01	pCi/g	N/A	RD3219
K-40	9.57E+00	5.7E-01	1.1E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	8.63E-01	4.5E-02	9.7E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	8.13E-01	7.0E-02	1.1E-01	N/A	pCi/g	N/A	RD3219
RA-228DA	7.21E-01 J	1.3E-01	1.5E-01	N/A	pCi/g	N/A	RD3219
U-238DLP	2.76E+00 J	1.2E+00	1.2E+00	N/A	pCi/g	N/A	RD3219
ALPHA	9.95E+00	4.8E+00	4.9E+00	5.93E+00	pCi/g	100.00%	RD3222
BETA	2.06E+01	3.3E+00	3.6E+00	3.58E+00	pCi/g	100.00%	RD3222

Number of Results: 14

JBC 4-18-95

~~GOOGRE~~

Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	**SDG:**	W0429
LAB SAMPLE ID:	50132305	**MATRIX:**	SOIL
CLIENT ID:	B0DMT3	**DATE RECEIVED:**	1/18/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
CO-58	1.43E-02 U	4.2E-02	4.2E-02	7.22E-02	pCi/g	N/A	RD3219
CO-60	2.43E+00	1.0E-01	2.6E-01	N/A	pCi/g	N/A	RD3219
CS-137DA	3.09E+00	1.0E-01	3.3E-01	N/A	pCi/g	N/A	RD3219
EU-152	1.96E+00	1.7E-01	2.6E-01	N/A	pCi/g	N/A	RD3219
EU-154	4.60E-01	1.0E-01	1.1E-01	2.01E-01	pCi/g	N/A	RD3219
EU-155	1.12E-01 U	7.6E-02	7.6E-02	1.29E-01	pCi/g	N/A	RD3219
FE-59	-6.69E-02 U	1.1E-01	1.1E-01	1.78E-01	pCi/g	N/A	RD3219
K-40	6.77E+00	7.3E-01	9.9E-01	N/A	pCi/g	N/A	RD3219
RA-224DA	1.05E+00	8.0E-02	1.3E-01	N/A	pCi/g	N/A	RD3219
RA-226DA	8.01E-01	1.1E-01	1.3E-01	N/A	pCi/g	N/A	RD3219
RA-228DA	1.51E+00 J	2.5E-01	2.9E-01	N/A	pCi/g	N/A	RD3219
U-238DLP	5.90E+00 J	1.8E+00	1.9E+00	N/A	pCi/g	N/A	RD3219
ALPHA	2.50E+01	7.0E+00	7.5E+00	5.34E+00	pCi/g	100.00%	RD3222
BETA	2.11E+01	3.3E+00	3.6E+00	3.66E+00	pCi/g	100.00%	RD3222

Number of Results: 14

RBC 4-18-95

~~000782~~

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

March 13, 1995

Attention: Joan Kessner

SAF Number	:	B94-098
Date SDG Closed	:	January 26, 1995
Number of Samples	:	Two (2) - See ROD-B95-013
Sample Type	:	Soil
SDG Number	:	W0429
Data Deliverable	:	Stand Alone

I. Introduction

On January 18, 1995, seven water samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. After receipt, per ROD-B95-013, the samples were split into two separate SDGs for reporting purposes. The samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QTESRL ID	BHI ID	Matrix	Date of Receipt
50132303	B0DMT2	Soil	1/18/95
50132305	B0DMT3	Soil	1/18/95

II. Analytical Results/Methodology

The analytical results for this report are presented by laboratory sample ID. Each set of data includes sample identification information, analytical results and the appropriate associated statistical errors.

The requested analyses were:

Gamma Spectroscopy
Gamma Scan by method ITAS-RD-3219
Gas Proportional Counting
Gross Alpha by method ITAS-RD-3222
Gross Beta by method ITAS-RD-3222

III. Quality Control

The analytical results for each analysis performed under SDG W0429 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

Quality control sample results are reported in the same units as sample results with the exception of gross alpha and gross beta QC sample results which are reported in pCi/sample.

IV. Comments

BHI Off-site Property Control form W95-0-0204-3 identifies the samples as groundwater. The COC identifies the samples as soil.

Samples submitted as a single SDG, SDG W0386 (stand alone), were split into two SDGs after analysis had been started, W0386 (summary) and W0429 (stand alone), as per ROD-B95-013. The results are reported in two data packages, but were analyzed as a single batch with one set of QC.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
The Fe-59 and Eu-154 RDLs were not met for sample B0DMT2. The Co-58, Fe-59, Eu-154, and Eu-155 RDLs was not met for sample B0DMT3. The blank met the RDL requirements, therefore, the batch data are accepted. The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.

Quanterra
Environmental Services

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The batch was analyzed with two LCS samples. The soil lab is undergoing an investigation into the cause of a low spike bias for water spikes prepared in that area, and is preparing duplicate spikes for soil batches. LCS M013232S, which contains an iron carrier, is not used for reporting purposes. The LCS samples were recounted due to unacceptable recoveries and the recount result is accepted for M013231S. The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (B0DMT6) results are within contractual requirements, except as noted.

I certify that this Certificate of Analysis is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Reviewed and approved:

Suzanne Gaines
Project Manager

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9613497 1632

OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

RCS 1/17/95

REV. 3 . DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY:
1. EXPEDITED RESPONSE ACTION
2. ✓ TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA ✓ RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY ✓ REGULAR ✓ RADCHEM

SAMPLE MATRIX: ✓ SOIL/SEDIMENT WATER VEGETATION OILS
SLUDGE CONCRETE OTHER _____

LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
Quanterra (Main)	Not Applicable	N/A
Lockheed (Split)	Not Applicable	N/A

COMMENTS:

▸▸ Revision 1 — Changes to the EAL bottle requirements.

▸▸ Revision 2 — Change to laboratories.

▸▸ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

▸▸ Data Deliverable — Standalone

▸▸ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

~~PAGE 1 OF 1~~ BC

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

1-17-95 WST

Data Turnaround: [ ] Priority [X] Normal WST 1-17-95

Collector	Company Contact	Telephone No.
Dave St. John, Doug Bowers, Wendy Thompson	RC SMITH/MT STANKOVICH	(509)372-2537/(509)376-2493
Project Designation 100-D PONDS PHASE II SAMPLING	**Sampling Location** 100-D	**SAF No.** B94-098
Ice Chest No. SML 457 and ER 14	**Field Logbook No.**	**Method of Shipment** HAND DELIVER
Shipped To QUANTERRA	**Offsite Property No.**	**Bill of Lading/Air Bill No.** N/A

Possible Sample Hazards/Remarks

Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE

	A	B	C	D	E	F	G	H				
Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	Cool 4°	COOL 4	Cool 4°	
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	G	G
No. of Container(s)	1	1	1	1	1	1	1	1	3	1	1	1
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	500ml	950ml
SAMPLE ANALYSIS 501322	ICP METALS-TAL/AA MATALS (As,Pb,Se,Tl)	VOA-TCL	SEMI-VOA-TCL	PCB/PEST	SULFIDE	TOX	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3)	NO2-NO3	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	Total alpha beta Gamma Spec	total alpha beta gamma Spec 501323

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP	VOA	SEMI-VOA	PCB/PEST	SULFIDE	TOX	ANIONS	NO2-NO3	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN	Total alpha beta Gamma Spec	total alpha beta gamma Spec	
~~BODMR4~~ BODMT6 (WST 1-17-95)	1 S	1/17/95	0902	X	X	X	X	X	X	X	X	X WST	X	X	X	01
BODMS9	2 S	1/17/95	0907	X A			X B	X C				WST	X	X	X	2
BODMT2	3 S	1/17/95	0935	X	X	X	X	X	X	X	X	WST	X	X	X	3
BODMR2	4 S	1/17/95	0935	X	X	X	X	X	X	X	X	X	X			4
BODMT3	5 S	1/17/95	1047	X	X	X	X	X	X	X	X	X	X	X	X	5
BODMR3	6 S	1/17/95	1047	X	X	X	X	X	X	X	X	X	X			6

CHAIN OF POSSESSION	Date/Time	Received By	Date/Time
Relinquished By: Doug Bowers	1-18-95/0830	Received By: Rice Whitten B. Whitten ERC	0830 1-18-95
Relinquished By: Rice Whitten B. Whitten ERC	1-18-95 1058	Received By: A. Boyd Quanterra	1-18-95 1050
Relinquished By		Received By	
Relinquished By		Received By	

SPECIAL INSTRUCTIONS

DATA DELIVERABLE-STAND ALONE.
LABORATORY ANALYSIS FOR PHOSPHATE, NITRATE, NITRITE IS REQUESTED FOR "INFORMATION ONLY." THE ERC CONTRACTOR ACKNOWLEDGES THE 48-HOUR HOLDING TIME WILL NOT BE MET.

*=THE TOTAL VOLUME REQUIRED FOR TOTAL ALPHA/BETA, GEA ANALYSIS IS 1500g

BODMT2 - total alpha/beta/gamma provided in 1x500ml and 1x950ml.

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 SDG W0386
FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613491.1633

9613497.1634

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NO. (To be obtained from PROPERTY MANAGEMENT)
BHI		W95-0-0204-3

PART I - TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
ER Eng. Support	Field & Analytical Supp	Field Sampling

The following items are to be shipped from ☒ Contractor ☐ Vendor

Routing ☐ Prepaid ☐ Collect

Shipped to	Off-site Custodian
Company: Quanterra (IT) Address: 2800 Geo Wash Way City: Richland, State: Washington, Zip Code: 99352 Country:	On-site Custodian / Payroll No.

Qty.	Property No.	Description (include Manufacture Name, Model, Serial No.)	Acquisition Cost
1 lbs		Sample #: B0DMT6 B0DMS9 B0DMT2 B0DMR2 B0DMT3 B0DMR3 Cooler ID: SML-457 & ER-41 B0DMT5 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs		Sample #: Cooler ID: Polycooler with groundwater samples packed in wet ice and vermiculite	N/A

☐ Classified ☒ Unclassified ☐ Shipped Under DOE Contract ☐ Shipped Under Contractor's Use Permit Contract

Necessity for the off-site use of this property

☒ Required for Project Work. List Project No. 100-D-PONDS PHASE II

☐ Business Trip — Bill of Lading #: N/A

☐ Off-site Assignment

☐ Shipment to Subcontractor. List Subcontract No. N/A

☐ Other (Please specify) Sampling supports RI/FS work in the 100 AREA

RECEIVED

JAN 18 1995

PROPERTY RECORDS

CERTIFICATION OF THE RADIATION MONITORING RELEASE MUST BE SECURED THE SAME DAY THAT MATERIAL IS DELIVERED TO SHIPPING.

RM Clearance for Public Release	RM Survey No.	Date
[signature]	RARA - 0051	1-18-95

Location of and Contact for Property (Name/Phone No./Bldg./Area)

B.T. Whitten (509) 376-7777

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
1-18-95	ITE 2072 PV3AA	

Originated By	Date	Authorized By	Date
B.J. WHITTEN	1-18-95	[signature]	1-18-95
Property Representative Signature	**Date**	**Property Management Approval**	**Date**
		Debbie Rives	1/18/95

PART II - TO BE COMPLETED BY SHIPPING

Authorized Shipping Signature	Date
~~0026Bc~~	

DISTRIBUTION (AFTER FINAL SIGNATURES)

White - Property Management Yellow - Shipping Green - Accounts Payable Pink - Originator Goldenrod - Property Management

*U.S. GPO: 1994-592-170/00029

000021

9613497.1635

SAMPLE AND DATA MANAGEMENT RECORD OF DISPOSITION	ROD-B95-013 Record of Disposition No.

DATE: 01/31/95	LABORATORY: Quanterra
PROJECT TITLE/NO.: 100-D Ponds/B34-088	NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

W0429 ~~W0380~~ 50132203 + 05 32303 + 05

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable) W0386

W0430 ~~W0403~~ 50151712 + 51812

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable) W0403

DESCRIPTION OF EVENT:

1) These samples were collected in the first phase of the sampling event. They were analyzed together in one batch with one set of QC.

2) These samples were collected in the second phase of the sampling event. They were analyzed together in one batch with one set of QC.

SAF requests all data packages be standalone; two should be standalone and two should be summary.

DISPOSITION OF SAMPLES:

1) Results for samples B0DMT2 and B0DMT3 should be reported in one standalone data package. Results for samples B0DMT6, B0DMS9, B0DMR2, B0DMR3, and B0DMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample B0DMT4 should be reported in one standalone data package. Results from samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, and B0DMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

R. C. Smith/ [signature] — 1/31/95
OSM Project Coordinator (Print/Sign Name) — Date

M.T. Stankovich/ [signature] — 2/13/95
Technical Representative (Print/Sign Name) — Date

N/A — ~~C031~~ BC
Quality Assurance (Print/Sign Name) — Date

cc: Toby Vern Wade Suzi Vicki

000022

Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: 100-DR-1 D Ponds			DATA PACKAGE: W0429-QES		
VALIDATOR: RBC		LAB: QES		DATE: 30 Mar 95	
CASE:			SDG: W0429		

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

SAMPLES/MATRIX Soil

B0DMT2, B0DMT3

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: only Ge-2 calibrated w/in one year. No qualification required.

A-1 RBC

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: The checksource standard is not identified on the continuing calibration data. No qualification required.

4. Blanks . . . . . ☐ N/A

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

Comments:

5. Matrix Spikes . . . . . ☒ N/A

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

Comments:

A-2 (B-2)

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: U-238 % recovery 38.7% 'J'

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: Ra-228 - No duplicate 'J'

A-3/X

9. Field QC Samples . . . . . ☒ N/A

Field duplicate sample(s) analyzed?	Yes	No	N/A
Field duplicate RPD values acceptable?	Yes	No	N/A
Field split sample(s) analyzed?	Yes	No	N/A
Field split RPD values acceptable?	Yes	No	N/A
Performance audit sample(s) analyzed?	Yes	No	N/A
Performance audit sample results acceptable?	Yes	No	N/A

Comments:_____

10. Holding Times

Are sample holding times acceptable?	(Yes)	No	N/A

Comments:_____

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses?	(Yes)	No	N/A
Results supported in raw data?	(Yes)	No	N/A
Results Acceptable?	(Yes)	No	N/A
Transcription/Calculation errors?	Yes	(No)	N/A
MDA's meet required detection limits?	Yes	(No)	N/A
Transcription/calculation errors?	Yes	(No)	N/A

Comments:_____

Both Samples Eu 154 + Fe-59 MDA > CRDL

A-4/31