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Date: 12 November 1996
To: Bechtel Hanford Inc. (technical representative)
From: A.T. Kearney, Inc.
Project: 100-D-Ponds Verification Sampling
Subject: Inorganics - Data Package No. W01139-QES (SDG No. W01139)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W01139-QES prepared by Quanterra Environmental Services (QES). 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
B0HYS0	08/21/96	Soil	D	See Note 1
B0HYS1	08/21/96	Soil	D	See Note 1
B0HYS2	08/21/96	Soil	D	See Note 1
B0HYS3	08/21/96	Soil	D	See Note 1
B0HYS4	08/21/96	Soil	D	See Note 1
B0HYS5	08/21/96	Soil	D	See Note 1
B0HYS6	08/21/96	Soil	D	See Note 1
B0HYS7	08/21/96	Soil	D	See Note 1
B0HYS8	08/21/96	Soil	D	See Note 1
B0HYS9	08/21/96	Soil	D	See Note 1
B0HYT0	08/21/96	Soil	D	See Note 1
B0HYT1	08/21/96	Soil	D	See Note 1
B0HYT2	08/21/96	Soil	D	See Note 1
B0HYT3	08/21/96	Soil	D	See Note 1
B0HYT4	08/21/96	Soil	D	See Note 1
B0HYT5	08/21/96	Soil	D	See Note 1
B0HYT6	08/21/96	Soil	D	See Note 1
B0HYT7	08/21/96	Soil	D	See Note 1
B0HYT8	08/21/96	Soil	D	See Note 1

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1 - ICP Metals - 6010A (TAL); Arsenic - 7060 - (FAA); Lead - 7421 - (GFAA); Thallium - 7841 - (GFAA); Mercury - 7471 - (CV); Hexavalent Chromium - 7196 (digestion by 3060A).

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1992a). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times for mercury, GFAA and ICP metals are 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 GFAA and ICP metals and within 28 days for mercury.

Due to the holding time being exceeded, the mercury result for sample B0HYS5 was qualified as an estimate and flagged "J".

Holding time requirements for all other analytes were met.

- **Blanks**

Calibration Blanks

A calibration blank must be analyzed immediately after each 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 less than five times 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 of greater than five times 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 nondetects are qualified as estimates and flagged "UJ", and all positive results within two times the absolute value of the blank result are qualified as estimates and flagged "J". The qualification is applied only to results generated between the associated unacceptable calibration blank and the nearest acceptable blank.

All initial and continuing 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) less than five times the preparation blank value have had their associated values qualified as non-detected and flagged "U". Samples with concentrations of greater than five times the highest blank concentration do not require qualification.

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all nondetects are rejected and flagged "UR" and all detects that are less than ten times the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is greater than the IDL and less than or equal to the CRDL, all nondetects are qualified as estimates and flagged "UJ" and all detects less than ten times the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are greater than ten times the absolute value of the preparation blank, no qualification is necessary.

All preparation blank results were acceptable.

Field Blanks

One field blank, sample B0HSY0 was submitted for analysis. Iron, lead, manganese and zinc were detected in the field blank. Under WHC guidelines, no qualification based on field blank results is required. No other analytes were detected above the laboratory quantitation limit in the field blank sample.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within the range of 75% to 125%. Samples with a spike recovery of less than 30% and a sample result below the IDL are rejected and flagged "UR". Samples with a spike recovery of 30% to 74% and a sample result less than the IDL are qualified "UJ". Samples with a spike recovery of greater than 125% or less than 75% and a sample result greater than the IDL are qualified as estimates and flagged "J". Finally, for samples with a spike recovery greater than 125% and a sample result less than the IDL, no qualification is required.

Due to a matrix spike recovery of 147% and a matrix spike duplicate result of 160%, all aluminum results (all detects) were qualified as estimates and flagged "J".

Due to a matrix spike recovery of 140% and a matrix spike duplicate recovery of 571%, all manganese results (all detects) were qualified as estimates and flagged "J".

Due to a matrix spike duplicate recovery of 140%, barium results (all detects) in all samples were qualified as estimates and flagged "J".

Due to a matrix spike recovery of 44% and a matrix spike duplicate recovery of 53%, all thallium results (all nondetects) were qualified as estimates and flagged "UJ".

All other 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 is digested and analyzed for each sample batch that contains water samples. The results are compared against the control limit of 80-120% as required by the WHC data validation guidelines (WHC 1992a).

All LCS results were acceptable.

- **Precision**

Laboratory Duplicate Samples

Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Results must be within RPD limits of plus or minus 35% for solid samples. If RPD values are out of specification and the sample concentration is greater than five times the CRDL, all associated sample results are qualified as estimated and flagged "J". If RPD values are plus or minus two times the CRDL and the sample concentration is less than five times the CRDL, all associated sample results are qualified as estimated and flagged "J/UJ". The performance criteria for aqueous laboratory duplicates are an RPD less than 20% for positive sample results greater than five times the CRDL or plus or minus the CRDL for positive sample results less than five times the CRDL. Sample results outside the criteria are qualified as estimates and flagged "J/UJ".

The RPD for manganese was 121%. However, since all manganese results had already been qualified as estimates due to high matrix spike and matrix spike duplicate recoveries, no further action was required.

All other laboratory duplicate recovery results were acceptable.

Field Duplicate Samples

One pair of field duplicate samples were submitted to QES for analysis as shown below:

Sample No.	Duplicate Sample No.	Location
B0HYS7	B0HYS8	Settling Pond

The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate.

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 greater than or equal to 50 times the IDL for an analyte and the %D is greater than 10%, the associated data is qualified as an estimate and flagged "J".

Due to a percent difference outside QC limits, all calcium sample results with the exception of sample number B0HYS0, were qualified as estimates and flagged "J".

- **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 analyses exceeds the control window of 85 to 115 percent recovery and the absorbance of the sample is greater than fifty percent 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 greater than the 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 results were acceptable.

Analytical Spike Recoveries

For all samples whose analytical spike results are outside the 85 to 115 percent control limit, but whose absorbances are <50 percent of the analytical spike absorbance, the samples were qualified as estimates and flagged "J". In cases where the analytical spike recovery was <10 percent, non-detect results were rejected and flagged "UR".

All analytical spike recovery results were acceptable.

- **Detection Levels**

Reported detection levels are compared against CRDLs to ensure that laboratory detection levels meet the required criteria. All reported laboratory detection levels met the analyte specific CRDL.

- **Completeness**

Data Package No. W01139-QES (SDG No. W01139) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Minor deficiencies are as follows:

- Due to the holding time being exceeded, the mercury result for sample B0HYS5 was qualified as an estimate and flagged "J".
- Due to MS/MSD recoveries outside QC limits, all aluminum results with the exception of sample B0HYS0 were qualified as estimates and flagged "J".

- Due to MS/MSD recoveries outside QC limits, all manganese results were qualified as estimates and flagged "J".

- Due to MS/MSD recoveries outside QC limits, thallium results in all samples were qualified as estimates and flagged "UJ".

- Due to a MSD recovery of 140%, barium results (all detects) in all samples were qualified as estimates and flagged "J".

- The RPD for manganese was 121%. However, since all manganese results had already been qualified as estimates due to high matrix spike and matrix spike duplicate recoveries, no further action was required.

- Due to a percent difference outside QC limits, all calcium sample results with the exception of sample number B0HYS0, were qualified as estimates and flagged "J".

Data flagged "J" indicates that the associated concentration is an estimate, but under WHC guidelines, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1988a, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1988b, *Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses*, U.S. 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.

EPA, 1991, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, 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.

WHC, 1992b, *Data Validation Procedure for Radiological Analyses*, WHC-SD-EN-SPP-001, Rev. 2, Westinghouse Hanford Company, 1993.

EPA, 1994, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1994, *Validation Statement of Work*, Rev.1, Westinghouse Hanford Company, 1994.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with WHC guidelines are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. Due to a QC deficiency identified during the data validation, the associated concentration is an estimate, but the data are usable for decision-making purposes.

BJ - Applied to inorganic analyses only. Indicates the analyte concentration was greater than the IDL but less than the CRDL and is considered an estimated value.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W01139	REVIEWER: RBC	DATE: 11/12/96	PAGE 1 OF 2
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Mercury	J	B0HYS5	Holding time exceeded.
Aluminum	J	B0HYS0, B0HYS1, B0HYS2, B0HYS3, B0HYS4, B0HYS5, B0HYS6, B0HYS7, B0HYS8, B0HYS9, B0HYT0, B0HYT1, B0HYT2, B0HYT3, B0HYT4, B0HYT5, B0HYT6, B0HYT7, B0HYT8	MS/MSD recoveries above QC limits.
Manganese	J	B0HSY0, B0HYS1, B0HYS2, B0HYS3, B0HYS4, B0HYS5, B0HYS6, B0HYS7, B0HYS8, B0HYS9, B0HYT0, B0HYT1, B0HYT2, B0HYT3, B0HYT4, B0HYT5, B0HYT6, B0HYT7, B0HYT8	MS/MSD recoveries above QC limits.
Thallium	UJ	B0HSY0, B0HYS1, B0HYS2, B0HYS3, B0HYS4, B0HYS5, B0HYS6, B0HYS7, B0HYS8, B0HYS9, B0HYT0, B0HYT1, B0HYT2, B0HYT3, B0HYT4, B0HYT5, B0HYT6, B0HYT7, B0HYT8	MS/MSD recoveries below QC limits.
Thallium	J	B0HYS2, B0HYS3, B0HYT2, B0HYT3, B0HYT4, B0HYT5, B0HYT7	MS/MSD recoveries below QC limits.
Barium	J	B0HSY0, B0HYS1, B0HYS2, B0HYS3, B0HYS4, B0HYS5, B0HYS6, B0HYS7, B0HYS8, B0HYS9, B0HYT0, B0HYT1, B0HYT2, B0HYT3, B0HYT4, B0HYT5, B0HYT6, B0HYT7, B0HYT8	MSD recovery above QC limits.

DATA QUALIFICATION SUMMARY

SDG: W01139	REVIEWER: RBC	DATE: 11/12/96	PAGE 2 OF 2
Manganese	J	B0HYS0, B0HYS1, B0HYS2, B0HYS3, B0HYS4, B0HYS5, B0HYS6, B0HYS7, B0HYS8, B0HYS9, B0HYT0, B0HYT1, B0HYT2, B0HYT3, B0HYT4, B0HYT5, B0HYT6, B0HYT7, B0HYT8	RPD outside QC limits.
Calcium	J	B0HYS1, B0HYS2, B0HYS3, B0HYS4, B0HYS5, B0HYS6, B0HYS7, B0HYS8, B0HYS9, B0HYT0, B0HYT1, B0HYT2, B0HYT3, B0HYT4, B0HYT5, B0HYT6, B0HYT7, B0HYT8	ICP serial dilution % above QC limits.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, SOIL MATRIX, (mg/kg)

Project: BECHTEL-HANFORD																					
Laboratory: Quanterra																					
Case	SDG: W01139																				
Sample Number		B0HYS0		B0HYS1		B0HYS2		B0HYS3		B0HYS4		B0HYS5		B0HYS6		B0HYS7		B0HYS8		B0HYS9	
Location		Settling Pond		Settling Pond		Settling Pond		Test Pit		Settling Pond		Test Pit		Settling Pond		Settling Pond		Settling Pond		Settling Pond	
Remarks		Field Blank																Duplicate			
Sample Date		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96	
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminium	20	290	J	5040	J	3720	J	4330	J	3900	J	9560	J	5000	J	4430	J	4420	J	3990	J
Anitmony	6	4.4	U	4.7	U	4.6	U	4.7	U	4.6	U	4.9	U	4.7	U	4.6	U	5.3		4.7	U
Arsenic	1	0.11		0.52		0.58		0.41		0.58		2.5		0.50		0.55		0.49		0.49	
Barium	20	5.30	J	113	J	86.2	J	87.0	J	77.2	J	90.1	J	166	J	79.6	J	68.6	J	108	J
Beryllium	0.5	0.23		0.60		0.54		0.54		0.53		0.51		0.58		0.52		0.49		0.54	
Cadmium	0.5	0.33	U	1.2		1.3		1.2		1.2		1.4		1.1		1.1		1.4		0.95	
Calcium	500	88.9	J	12700	J	4410	J	10300	J	6260	J	4110	J	12600	J	4070	J	3980	J	13200	J
Chromium	1	0.29	U	4.0		4.2		3.0		4.2		10.1		3.8		5.4		6.2		3.3	
Cobalt	5	0.29	U	13.6		13.2		12.1		13.5		12.6		13.1		13.8		13.6		12.2	
Copper	2.5	0.72	U	13.1		12.0		13.1		11.5		16.0		11.8		11.3		10.4		11.8	
Iron	10	2360		27500		25700		23400		27200		26900		26200		28000		26900		24600	
Lead	0.3	0.88		1.7		1.4		1.4		1.3		6.4		1.6		1.3		1.2		1.4	
Magnesium	500	29.6		4820		4150		4570		4580		3990		4770		4350		4660		4390	
Manganese	1.5	41.0	J	335	J	321	J	288	J	345	J	327	J	298	J	340	J	322	J	282	J
Mercury	0.2	0.02	U	0.02	U	0.02	U	0.02	U	0.02	U	5.3	J	0.02	U	0.02	U	0.02	U	0.02	U
Nickel	4	1.0	U	8.6		8.1		8.0		9.1		7.6		6.6		9.3		13.3		8.0	
Potassium	500	330	U	405		345	U	443		488		514		467		345	U	435		421	
Silver	1	0.59		0.54		0.55		0.66		0.74		0.65		0.47		0.65		0.70		0.80	
Sodium	500	20.4		284		245		241		213		247		253		230		223		227	
Thallium	0.5	0.11	UJ	0.12	UJ	0.13	J	0.12	J	0.11	UJ	0.12	UJ	0.12	UJ	0.11	UJ	0.12	UJ	0.12	UJ
Vanadium	5	0.31	U	72.2		71.3		56.7		71.4		70.3		70.4		75.4		70.9		65.8	
Zinc	2	7.3		51.1		45.8		44.9		46.7		93.6		47.6		54.5		54.2		43.8	
Chromium VI	N/A	<0.57	U	<0.57	U	0.623		<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U

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Project: BECHTEL--HANFORD																					
Laboratory: Quanterra																					
Case	SDG: W01139																				
Sample Number		B0HYT0		B0HYT1		B0HYT2		B0HYT3		B0HYT4		B0HYT5		B0HYT6		B0HYT7		B0HYT8			
Location		Settling Pond Bank		Settling Pond		Settling Pond		Percolation Pond		Percolation Pond		Percolation Pond		Percolation Pond		Percolation Pond		Percolation Pond			
Remarks																					
Sample Date		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96			
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminium	20	3630	J	4920	J	5370	J	5090	J	6120	J	4900	J	4840	J	10500	J	5860	J		
Anitmony	6	4.5	U	4.7		4.6	U	4.4	U	4.5	U	5.4		4.4	U	4.5	U	4.4	U		
Arsenic	1	0.52		0.62		0.81		0.72		1.4		0.89		0.89		4.2		1.1			
Barium	20	76.6	J	96.5	J	105	J	158	J	159	J	121	J	120	J	115	J	142	J		
Beryllium	0.5	0.39		0.55		0.61		0.59		0.61		0.56		0.57		0.63		0.61			
Cadmium	0.5	0.99		1.0		1.2		1.4		1.2		1.4		1.5		1.1		1.3			
Calcium	500	4310	J	9000	J	10200	J	7270	J	7230	J	6890	J	6770	J	7480	J	7550	J		
Chromium	1	3.0		4.3		5.0		4.1		7.1		4.9		5.2		22.5		6.6			
Cobalt	5	9.9		12.4		12.7		11.9		11.9		12.5		12.7		9.6		12.2			
Copper	2.5	11.1		11.1		13.3		11.7		14.6		11.8		12.4		14.0		13.6			
Iron	10	19500		25400		27400		25300		25000		26200		27200		22000		26600			
Lead	0.3	1.6		1.6		1.7		2.0		3.5		2.2		2.1		5.5		2.4			
Magnesium	500	4050		4540		4900		4450		4690		4580		4540		6350		4910			
Manganese	1.5	266	J	295	J	305	J	292	J	338	J	300	J	328	J	362	J	316	J		
Mercury	0.2	0.02	U	0.02	U	0.02	U	0.05		0.12		0.04		0.02		0.02	U	0.02	U		
Nickel	4	7.2		6.5		8.0		8.1		8.4		7.9		7.7		19.3		8.4			
Potassium	500	343	U	378		519		376		606		483		647		1460		668			
Silver	1	0.85		0.68		0.58		0.73		0.49		0.72		0.87		0.96		0.75			
Sodium	500	207		219		248		377		281		283		279		219		293			
Thallium	0.5	0.11	UJ	0.12	UJ	0.13	J	0.16	J	0.18	J	0.15	J	0.11	UJ	0.19	J	0.11	UJ		
Vanadium	5	39.1		67.2		71.1		66.5		64.8		67.9		68.4		45.6		68.4			
Zinc	2	37.4		46.9		49.2		48.4		59.5		49.8		53.9		55.8		55.8			
Chromium VI	N/A	<0.57	U	<0.57	U	0.840		<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U	<0.57	U		

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYS0

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-001

Level (low/med): LOW Date Received: 08/22/96

% Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	290		N	P	J
7440-36-0	Antimony	4.4	U		P	
7440-38-2	Arsenic	0.11	B		F	
7440-39-3	Barium	5.3	B	N	P	J
7440-41-7	Beryllium	0.23	B		P	
7440-43-9	Cadmium	0.33	U		P	
7440-70-2	Calcium	88.9	B	E	P	
7440-47-3	Chromium	0.29	U		P	
7440-48-4	Cobalt	0.29	U		P	
7440-50-8	Copper	0.72	U		P	
7439-89-6	Iron	2360			P	
7439-92-1	Lead	0.88			F	
7439-95-4	Magnesium	29.6	B		P	
7439-96-5	Manganese	41.0		N	P	J
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	1.0	U		P	
7440-09-7	Potassium	330	U		P	
7440-22-4	Silver	0.59	B		P	
7440-23-5	Sodium	20.4	B		P	
7440-28-0	Thallium	0.11	U	N	F	UJ
7440-62-2	Vanadium	0.31	U		P	
7440-66-6	Zinc	7.3			P	

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYS1

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-002

Level (low/med): LOW Date Received: 08/22/96

% Solids: 93.8

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5040		N	P	J
7440-36-0	Antimony	4.7	U		P	
7440-38-2	Arsenic	0.52	B		F	
7440-39-3	Barium	113		N	P	J
7440-41-7	Beryllium	0.60			P	
7440-43-9	Cadmium	1.2			P	
7440-70-2	Calcium	12700		E	P	J
7440-47-3	Chromium	4.0			P	
7440-48-4	Cobalt	13.6			P	
7440-50-8	Copper	13.1			P	
7439-89-6	Iron	27500			P	
7439-92-1	Lead	1.7			F	
7439-95-4	Magnesium	4820			P	
7439-96-5	Manganese	335		N	P	J
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	8.6			P	
7440-09-7	Potassium	405	B		P	
7440-22-4	Silver	0.54	B		P	
7440-23-5	Sodium	284			P	
7440-28-0	Thallium	0.12	U	N	F	UJ
7440-62-2	Vanadium	72.2			P	
7440-66-6	Zinc	51.1			P	

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYS2

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-003

Level (low/med): LOW Date Received: 08/22/96

% Solids: 95.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3720		N	P	J
7440-36-0	Antimony	4.6	U		P	
7440-38-2	Arsenic	0.58	B		F	
7440-39-3	Barium	86.2		N	P	J
7440-41-7	Beryllium	0.54			P	
7440-43-9	Cadmium	1.3			P	
7440-70-2	Calcium	4410		E	P	J
7440-47-3	Chromium	4.2			P	
7440-48-4	Cobalt	13.2			P	
7440-50-8	Copper	12.0			P	
7439-89-6	Iron	25700			P	
7439-92-1	Lead	1.4			F	
7439-95-4	Magnesium	4150			P	
7439-96-5	Manganese	321		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	8.1			P	
7440-09-7	Potassium	345	U		P	
7440-22-4	Silver	0.55	B		P	
7440-23-5	Sodium	245			P	
7440-28-0	Thallium	0.13	~~B~~	N	F	J
7440-62-2	Vanadium	71.3			P	
7440-66-6	Zinc	45.8			P	

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYS3

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-004

Level (low/med): LOW Date Received: 08/22/96

% Solids: 92.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4330		N	P	J
7440-36-0	Antimony	4.7	U		P	
7440-38-2	Arsenic	0.41	B		F	
7440-39-3	Barium	87.0		N	P	J
7440-41-7	Beryllium	0.54			P	
7440-43-9	Cadmium	1.2			P	
7440-70-2	Calcium	10300		E	P	J
7440-47-3	Chromium	3.0			P	
7440-48-4	Cobalt	12.1			P	
7440-50-8	Copper	13.1			P	
7439-89-6	Iron	23400			P	
7439-92-1	Lead	1.4			F	
7439-95-4	Magnesium	4570			P	
7439-96-5	Manganese	288		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	8.0			P	
7440-09-7	Potassium	443	B		P	
7440-22-4	Silver	0.66	B		P	
7440-23-5	Sodium	241			P	
7440-28-0	Thallium	0.12	~~B~~	N	F	J
7440-62-2	Vanadium	56.7			P	
7440-66-6	Zinc	44.9			P	

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYS4

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-005

Level (low/med): LOW Date Received: 08/22/96

% Solids: 96.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3900		N	P	J
7440-36-0	Antimony	4.6	U		P	
7440-38-2	Arsenic	0.58	B		F	
7440-39-3	Barium	77.2		N	P	J
7440-41-7	Beryllium	0.53			P	
7440-43-9	Cadmium	1.2			P	
7440-70-2	Calcium	6260		E	P	J
7440-47-3	Chromium	4.2			P	
7440-48-4	Cobalt	13.5			P	
7440-50-8	Copper	11.5			P	
7439-89-6	Iron	27200			P	
7439-92-1	Lead	1.3			F	
7439-95-4	Magnesium	4580			P	
7439-96-5	Manganese	345		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	9.1			P	
7440-09-7	Potassium	488	B		P	
7440-22-4	Silver	0.74	B		P	
7440-23-5	Sodium	213			P	
7440-28-0	Thallium	0.11	U	N	F	UJ
7440-62-2	Vanadium	71.4			P	
7440-66-6	Zinc	46.7			P	

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYS5

Lab Name: QUANTERRA MO Contract: 550.168
Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139
Matrix (soil/water): SOIL Lab Sample ID: 11923-006
Level (low/med): LOW Date Received: 08/22/96
% Solids: 90.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	9560		N	P	J
7440-36-0	Antimony	4.9	U		P	
7440-38-2	Arsenic	2.5			F	
7440-39-3	Barium	90.1		N	P	J
7440-41-7	Beryllium	0.51	B		P	
7440-43-9	Cadmium	1.4			P	
7440-70-2	Calcium	4110		E	P	J
7440-47-3	Chromium	10.1			P	
7440-48-4	Cobalt	12.6			P	
7440-50-8	Copper	16.0			P	
7439-89-6	Iron	26900			P	
7439-92-1	Lead	6.4			F	
7439-95-4	Magnesium	3990			P	
7439-96-5	Manganese	327		N	P	
7439-97-6	Mercury	5.3			CV	J
7440-02-0	Nickel	7.6			P	
7440-09-7	Potassium	514	B		P	
7440-22-4	Silver	0.65	B		P	
7440-23-5	Sodium	247			P	
7440-28-0	Thallium	0.12	U	N	F	UJ
7440-62-2	Vanadium	70.3			P	
7440-66-6	Zinc	93.6			P	

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EPA SAMPLE NO.

B0HYS6

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-007

Level (low/med): LOW Date Received: 08/22/96

% Solids: 93.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5000		N	P	J
7440-36-0	Antimony	4.7	U		P	
7440-38-2	Arsenic	0.50	B		F	
7440-39-3	Barium	166		N	P	J
7440-41-7	Beryllium	0.58			P	
7440-43-9	Cadmium	1.1			P	
7440-70-2	Calcium	12600		E	P	J
7440-47-3	Chromium	3.8			P	
7440-48-4	Cobalt	13.1			P	
7440-50-8	Copper	11.8			P	
7439-89-6	Iron	26200			P	
7439-92-1	Lead	1.6			F	
7439-95-4	Magnesium	4770			P	
7439-96-5	Manganese	298		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	6.6			P	
7440-09-7	Potassium	467	B		P	
7440-22-4	Silver	0.47	B		P	
7440-23-5	Sodium	253			P	
7440-28-0	Thallium	0.12	U	N	F	UJ
7440-62-2	Vanadium	70.4			P	
7440-66-6	Zinc	47.6			P	

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EPA SAMPLE NO.

B0HYS7

Lab Name: QUANTERRA MO Contract: 550.168
Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139
Matrix (soil/water): SOIL Lab Sample ID: 11923-008
Level (low/med): LOW Date Received: 08/22/96
% Solids: 95.7

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4430		N	P	J
7440-36-0	Antimony	4.6	U		P	
7440-38-2	Arsenic	0.55	B		F	
7440-39-3	Barium	79.6		N	P	J
7440-41-7	Beryllium	0.52	B		P	
7440-43-9	Cadmium	1.1			P	
7440-70-2	Calcium	4070		E	P	J
7440-47-3	Chromium	5.4			P	
7440-48-4	Cobalt	13.8			P	
7440-50-8	Copper	11.3			P	
7439-89-6	Iron	28000			P	
7439-92-1	Lead	1.3			F	
7439-95-4	Magnesium	4350			P	
7439-96-5	Manganese	340		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	9.3			P	
7440-09-7	Potassium	345	U		P	
7440-22-4	Silver	0.65	B		P	
7440-23-5	Sodium	230			P	
7440-28-0	Thallium	0.11	U	N	F	UJ
7440-62-2	Vanadium	75.4			P	
7440-66-6	Zinc	54.5			P	

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYS8

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-009

Level (low/med): LOW Date Received: 08/22/96

% Solids: 95.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4420		N	P	J
7440-36-0	Antimony	5.3	B		P	
7440-38-2	Arsenic	0.49	B		F	
7440-39-3	Barium	68.6		N	P	J
7440-41-7	Beryllium	0.49	B		P	
7440-43-9	Cadmium	1.4			P	
7440-70-2	Calcium	3980		E	P	J
7440-47-3	Chromium	6.2			P	
7440-48-4	Cobalt	13.6			P	
7440-50-8	Copper	10.4			P	
7439-89-6	Iron	26900			P	
7439-92-1	Lead	1.2			F	
7439-95-4	Magnesium	4660			P	
7439-96-5	Manganese	322		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	13.3			P	
7440-09-7	Potassium	435	B		P	
7440-22-4	Silver	0.70	B		P	
7440-23-5	Sodium	223			P	
7440-28-0	Thallium	0.12	U	N	F	UJ
7440-62-2	Vanadium	70.9			P	
7440-66-6	Zinc	54.2			P	

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYS9

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-010

Level (low/med): LOW Date Received: 08/22/96

% Solids: 92.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3990		N	P	J
7440-36-0	Antimony	4.7	U		P	
7440-38-2	Arsenic	0.49	B		F	
7440-39-3	Barium	108		N	P	J
7440-41-7	Beryllium	0.54			P	
7440-43-9	Cadmium	0.95			P	
7440-70-2	Calcium	13200		E	P	J
7440-47-3	Chromium	3.3			P	
7440-48-4	Cobalt	12.2			P	
7440-50-8	Copper	11.8			P	
7439-89-6	Iron	24600			P	
7439-92-1	Lead	1.4			F	
7439-95-4	Magnesium	4390			P	
7439-96-5	Manganese	282		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	8.0			P	
7440-09-7	Potassium	421	B		P	
7440-22-4	Silver	0.80	B		P	
7440-23-5	Sodium	227			P	
7440-28-0	Thallium	0.12	U	N	F	UJ
7440-62-2	Vanadium	65.8			P	
7440-66-6	Zinc	43.8			P	

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYT0

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-011

Level (low/med): LOW Date Received: 08/22/96

% Solids: 96.4

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	3630		N	P	J
7440-36-0	Antimony	4.5	U		P	
7440-38-2	Arsenic	0.52	B		F	
7440-39-3	Barium	76.6		N	P	J
7440-41-7	Beryllium	0.39	B		P	
7440-43-9	Cadmium	0.99			P	
7440-70-2	Calcium	4310		E	P	J
7440-47-3	Chromium	3.0			P	
7440-48-4	Cobalt	9.9			P	
7440-50-8	Copper	11.1			P	
7439-89-6	Iron	19500			P	
7439-92-1	Lead	1.6			F	
7439-95-4	Magnesium	4050			P	
7439-96-5	Manganese	266		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	7.2			P	
7440-09-7	Potassium	343	U		P	
7440-22-4	Silver	0.85	B		P	
7440-23-5	Sodium	207			P	
7440-28-0	Thallium	0.11	U	N	F	UJ
7440-62-2	Vanadium	39.1			P	
7440-66-6	Zinc	37.4			P	

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYT1

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-012

Level (low/med): LOW Date Received: 08/22/96

% Solids: 95.1

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4920		N	P	J
7440-36-0	Antimony	4.7	B		P	
7440-38-2	Arsenic	0.62	B		F	
7440-39-3	Barium	96.5		N	P	J
7440-41-7	Beryllium	0.55			P	
7440-43-9	Cadmium	1.0			P	
7440-70-2	Calcium	9000		E	P	J
7440-47-3	Chromium	4.3			P	
7440-48-4	Cobalt	12.4			P	
7440-50-8	Copper	11.1			P	
7439-89-6	Iron	25400			P	
7439-92-1	Lead	1.6			F	
7439-95-4	Magnesium	4540			P	
7439-96-5	Manganese	295		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	6.5			P	
7440-09-7	Potassium	378	B		P	
7440-22-4	Silver	0.68	B		P	
7440-23-5	Sodium	219			P	
7440-28-0	Thallium	0.12	U	N	F	UJ
7440-62-2	Vanadium	67.2			P	
7440-66-6	Zinc	46.9			P	

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYT2

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-013

Level (low/med): LOW Date Received: 08/22/96

% Solids: 94.2

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5370		N	P	J
7440-36-0	Antimony	4.6	U		P	
7440-38-2	Arsenic	0.81	B		F	
7440-39-3	Barium	105		N	P	J
7440-41-7	Beryllium	0.61			P	
7440-43-9	Cadmium	1.2			P	
7440-70-2	Calcium	10200		E	P	J
7440-47-3	Chromium	5.0			P	
7440-48-4	Cobalt	12.7			P	
7440-50-8	Copper	13.3			P	
7439-89-6	Iron	27400			P	
7439-92-1	Lead	1.7			F	
7439-95-4	Magnesium	4900			P	
7439-96-5	Manganese	305		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	8.0			P	
7440-09-7	Potassium	519	B		P	
7440-22-4	Silver	0.58	B		P	
7440-23-5	Sodium	248			P	
7440-28-0	Thallium	0.13	B	N	F	J
7440-62-2	Vanadium	71.1			P	
7440-66-6	Zinc	49.2			P	

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

SW-846

RBL 10/31/96

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYT3

Lab Name: QUANTERRA_MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-014

Level (low/med): LOW Date Received: 08/22/96

% Solids: 99.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5090		N	P	J
7440-36-0	Antimony	4.4	U		P	
7440-38-2	Arsenic	0.72	B		F	
7440-39-3	Barium	158		N	P	J
7440-41-7	Beryllium	0.59			P	
7440-43-9	Cadmium	1.4			P	
7440-70-2	Calcium	7270		E	P	J
7440-47-3	Chromium	4.1			P	
7440-48-4	Cobalt	11.9			P	
7440-50-8	Copper	11.7			P	
7439-89-6	Iron	25300			P	
7439-92-1	Lead	2.0			F	
7439-95-4	Magnesium	4450			P	
7439-96-5	Manganese	292		N	P	
7439-97-6	Mercury	0.05			CV	
7440-02-0	Nickel	8.1			P	
7440-09-7	Potassium	376	B		P	
7440-22-4	Silver	0.73	B		P	
7440-23-5	Sodium	377			P	
7440-28-0	Thallium	0.16	B	N	F	J
7440-62-2	Vanadium	66.5			P	
7440-66-6	Zinc	48.4			P	

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN SW-846

RJC 10/31/96

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYT4

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-015

Level (low/med): LOW Date Received: 08/22/96

% Solids: 97.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	6120		N	P	J
7440-36-0	Antimony	4.5	U		P	
7440-38-2	Arsenic	1.4			F	
7440-39-3	Barium	159		N	P	J
7440-41-7	Beryllium	0.61			P	
7440-43-9	Cadmium	1.2			P	
7440-70-2	Calcium	7230		E	P	J
7440-47-3	Chromium	7.1			P	
7440-48-4	Cobalt	11.9			P	
7440-50-8	Copper	14.6			P	
7439-89-6	Iron	25000			P	
7439-92-1	Lead	3.5			F	
7439-95-4	Magnesium	4690			P	
7439-96-5	Manganese	338		N	P	
7439-97-6	Mercury	0.12			CV	
7440-02-0	Nickel	8.4			P	
7440-09-7	Potassium	606			P	
7440-22-4	Silver	0.49	B		P	
7440-23-5	Sodium	281			P	
7440-28-0	Thallium	0.18	~~B~~	N	F	J
7440-62-2	Vanadium	64.8			P	
7440-66-6	Zinc	59.5			P	

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

SW-846

RBC

10/31/96

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYT5

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-016

Level (low/med): LOW Date Received: 08/22/96

% Solids: 99.0

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4900		N	P	J
7440-36-0	Antimony	5.4	B		P	
7440-38-2	Arsenic	0.89	B		F	
7440-39-3	Barium	121		N	P	J
7440-41-7	Beryllium	0.56			P	
7440-43-9	Cadmium	1.4			P	
7440-70-2	Calcium	6890		E	P	J
7440-47-3	Chromium	4.9			P	
7440-48-4	Cobalt	12.5			P	
7440-50-8	Copper	11.8			P	
7439-89-6	Iron	26200			P	
7439-92-1	Lead	2.2			F	
7439-95-4	Magnesium	4580			P	
7439-96-5	Manganese	300		N	P	
7439-97-6	Mercury	0.04			CV	
7440-02-0	Nickel	7.9			P	
7440-09-7	Potassium	483	B		P	
7440-22-4	Silver	0.72	B		P	
7440-23-5	Sodium	283			P	
7440-28-0	Thallium	0.15	~~B~~	N	F	J
7440-62-2	Vanadium	67.9			P	
7440-66-6	Zinc	49.8			P	

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

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10/31/96

U.S. EPA - CLP

1
INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYT6

Lab Name: QUANTERRA_MO_____ Contract: 550.168___
Lab Code: ITMO__ Case No.:_____ SAS No.:_____ SDG No.: W01139_____
Matrix (soil/water): SOIL_ Lab Sample ID: 11923-017
Level (low/med): LOW__ Date Received: 08/22/96
% Solids: _98.9

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4840		N	P	J
7440-36-0	Antimony	4.4	U		P	
7440-38-2	Arsenic	0.89	B		F	
7440-39-3	Barium	120		N	P	J
7440-41-7	Beryllium	0.57			P	
7440-43-9	Cadmium	1.5			P	
7440-70-2	Calcium	6770		E	P	J
7440-47-3	Chromium	5.2			P	
7440-48-4	Cobalt	12.7			P	
7440-50-8	Copper	12.4			P	
7439-89-6	Iron	27200			P	
7439-92-1	Lead	2.1			F	
7439-95-4	Magnesium	4540			P	
7439-96-5	Manganese	328		N	P	
7439-97-6	Mercury	0.02	B		CV	
7440-02-0	Nickel	7.7			P	
7440-09-7	Potassium	647			P	
7440-22-4	Silver	0.87	B		P	
7440-23-5	Sodium	279			P	
7440-28-0	Thallium	0.11	~~U~~	N	F	UJ
7440-62-2	Vanadium	68.4			P	
7440-66-6	Zinc	53.9			P	

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

Comments:

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10/31/96

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYT7

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-018

Level (low/med): LOW Date Received: 08/22/96

% Solids: 97.3

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	10500		N	P	J
7440-36-0	Antimony	4.5	U		P	
7440-38-2	Arsenic	4.2			F	
7440-39-3	Barium	115		N	P	J
7440-41-7	Beryllium	0.63			P	
7440-43-9	Cadmium	1.1			P	
7440-70-2	Calcium	7480		E	P	J
7440-47-3	Chromium	22.5			P	
7440-48-4	Cobalt	9.6			P	
7440-50-8	Copper	14.0			P	
7439-89-6	Iron	22000			P	
7439-92-1	Lead	5.5			F	
7439-95-4	Magnesium	6350			P	
7439-96-5	Manganese	362		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	19.3			P	
7440-09-7	Potassium	1460			P	
7440-22-4	Silver	0.96	B		P	
7440-23-5	Sodium	219			P	
7440-28-0	Thallium	0.19	B	N	F	J
7440-62-2	Vanadium	45.6			P	
7440-66-6	Zinc	55.8			P	

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

SW-846

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10/31/96

U.S. EPA - CLP

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INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0HYT8

Lab Name: QUANTERRA MO Contract: 550.168

Lab Code: ITMO Case No.: SAS No.: SDG No.: W01139

Matrix (soil/water): SOIL Lab Sample ID: 11923-019

Level (low/med): LOW Date Received: 08/22/96

% Solids: 99.5

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	5860		N	P	J
7440-36-0	Antimony	4.4	U		P	
7440-38-2	Arsenic	1.1			F	
7440-39-3	Barium	142		N	P	J
7440-41-7	Beryllium	0.61			P	
7440-43-9	Cadmium	1.3			P	
7440-70-2	Calcium	7550		E	P	J
7440-47-3	Chromium	6.6			P	
7440-48-4	Cobalt	12.2			P	
7440-50-8	Copper	13.6			P	
7439-89-6	Iron	26600			P	
7439-92-1	Lead	2.4			F	
7439-95-4	Magnesium	4910			P	
7439-96-5	Manganese	316		N	P	
7439-97-6	Mercury	0.02	U		CV	
7440-02-0	Nickel	8.4			P	
7440-09-7	Potassium	668			P	
7440-22-4	Silver	0.75	B		P	
7440-23-5	Sodium	293			P	
7440-28-0	Thallium	0.11	U	N	F	UJ
7440-62-2	Vanadium	68.4			P	
7440-66-6	Zinc	55.8			P	

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

FORM I - IN

SW-846

RKS
10/3/96

HEXAVALENT CHROMIUM DATA SUMMARY

SDG. W01139

ANALYSIS DATE. 8/23/96

MATRIX: SOIL

METHOD RICHWC5005

MDL: 0.57 mg/kg

SAMPLE LAB. ID	CLIENT ID	SAMPLE RESULT	UNITS	SPIKE ADDED	UNITS	SPIKE RECOVERED	UNITS	PERCENT RECOVERY
Prep Blank #1		0.002	mg/L					
LCS #1		0.425	mg/L	0.500	mg/L	0.425	mg/L	85
Prep Blank #2		0.001	mg/L					
LCS #2		0.503	mg/L	0.500	mg/L	0.503	mg/L	100.6
60830801	B0HYS0	< 0.57	mg/Kg					
60830801 Dup	B0HYS0	< 0.57	mg/Kg					
60830801 MS	B0HYS0	33.67	mg/Kg	39.98	mg/Kg	33.67	mg/Kg	84.2
60830801 MSD	B0HYS0	34.43	mg/Kg	39.98	mg/Kg	34.43	mg/Kg	86.1
60830801 $PbCrO_4$	B0HYS0	605.6	mg/Kg	669.2	mg/Kg	605.6	mg/Kg	90.5
60830802	B0HYS1	< 0.57	mg/Kg					
60830803	B0HYS2	0.623	mg/Kg					
60830804	B0HYS3	< 0.57	mg/Kg					
60830805	B0HYS4	< 0.57	mg/Kg					
60830806	B0HYS5	< 0.57	mg/Kg					
60830807	B0HYS6	< 0.57	mg/Kg					
60830808	B0HYS7	< 0.57	mg/Kg					
60830809	B0HYS8	< 0.57	mg/Kg					
60830810	B0HYS9	< 0.57	mg/Kg					
60830811	B0HYT0	< 0.57	mg/Kg					
60830812	B0HYT1	< 0.57	mg/Kg					
60830813	B0HYT2	0.840	mg/Kg					
60830814	B0HYT3	< 0.57	mg/Kg					
* 60830815	B0HYT4	< 0.57	mg/Kg					
* 60830815 Dup	B0HYT4	< 0.57	mg/Kg					
* 60830815 MS	B0HYT4	36.26	mg/Kg	39.98	mg/Kg	36.26	mg/Kg	90.7
* 60830815 MSD	B0HYT4	36.42	mg/Kg	39.97	mg/Kg	36.42	mg/Kg	91.1
* 60830815 $PbCrO_4$	B0HYT4	1074	mg/Kg	1047	mg/Kg	1074	mg/Kg	102.6
60830816	B0HYT5	< 0.57	mg/Kg					
60830817	B0HYT6	< 0.57	mg/Kg					
* 60830818	B0HYT7	< 0.57	mg/Kg					
60830819	B0HYT8	< 0.57	mg/Kg					

COMMENTS: * Results for samples #15 and 18, are reanalysis data. First run yielded low MS/MSD recoveries. 8/28/96

To convert preparation blank in mg/L to mg/kg: mg/kg = (mg/L * 0.1 L) / 0.0025kg

Form No.:CG-196, 8/95, Rev. 0

RMC 10/31/96

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

Quanterra
Environmental Services

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

OCT 1996
RECEIVED
Data
Log In

September 27, 1996

Attention: Joan Kessner

Project number	:	550.168
Date Received by Lab	:	August 22, 1996
Number of Samples	:	Nineteen (19)
Sample Type	:	Soil
SDG Number	:	W01139
Data Deliverable	:	Standalone

I. Introduction

On August 22, 1996, nineteen (19) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client IDs:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
11923-001	B0HYS0	60830701	Soil	08/22/96
11923-002	B0HYS1	60830702	Soil	08/22/96
11923-003	B0HYS2	60830703	Soil	08/22/96
11923-004	B0HYS3	60830704	Soil	08/22/96
11923-005	B0HYS4	60830705	Soil	08/22/96
11923-006	B0HYS5	60830706	Soil	08/22/96
11923-007	B0HYS6	60830707	Soil	08/22/96
11923-008	B0HYS7	60830708	Soil	08/22/96
11923-009	B0HYS8	60830709	Soil	08/22/96
11923-010	B0HYS9	60830710	Soil	08/22/96
11923-011	B0HYT0	60830711	Soil	08/22/96
11923-012	B0HYT1	60830712	Soil	08/22/96
11923-013	B0HYT2	60830713	Soil	08/22/96
11923-014	B0HYT3	60830714	Soil	08/22/96

Bechtel Hanford Incorporated
September 27,1996
Project Number: 550.150
SDG: W01139
Page 2

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
11923-015	B0HYT4	60830715	Soil	08/22/96
11923-016	B0HYT5	60830716	Soil	08/22/96
11923-017	B0HYT6	60830717	Soil	08/22/96
11923-018	B0HYT7	60830718	Soil	08/22/96
11923-019	B0HYT8	60830719	Soil	08/22/96

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.

Analyses requested: TCL Pesticide/PCBs by EPA method 8080. TAL ICP Metals by EPA method 6010. Mercury by EPA method 7471. Arsenic by EPA method 7060. Lead by EPA method 7421. Thallium by EPA method 7841. Hexavalent Chromium by EPA method 7196 was performed by QTESRL, the data is included in this package.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Matrix Spike Duplicate analyses were performed per the protocol for each analyte.

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

Bechtel Hanford Incorporated
September 27,1996
Project Number: 550.150
SDG: W01139
Page 3

V. Comments

Shipping and Receiving
There are no comments or nonconformances associated with the shipping and receiving of these samples.

Pesticide/PCBs
There were retention time shifts for some of the target compounds in a few of the continuing calibration checks. This shift, however, does not affect the reported results, for all the samples associated with these calibration checks were nondetect for the affected target compounds. Sample 11923-006 did have a positive hit for a PCB. However, PCB's are identified more by pattern recognition than by retention time.

Metals
The recoveries of the matrix spikes and/or the matrix spike duplicates for the following list of elements was not within the 80%-120% range , therefore all associated data was flagged with a " N ".

	%REC MS	%REC MSD
Thallium	44.3	53.0
Aluminum	147.4	160.1
Manganese	140.4	571
Barium	104.4*	140.7

* Meets criteria-for reference only

The recoveries of the Iron matrix spike and matrix spike duplicate were also less than 80% but did not require a flag because the sample concentration was greater than 4 X the spiking level.

Bechtel Hanford Incorporated
September 27,1996
Project Number: 550.150
SDG: W01139
Page 4

The percent difference for the Calcium serial dilution (46.9) was greater than 10 which is indicated on the forms by the " E " flag.

Sample 11923-006 gave Mercury results above the calibration range upon initial analysis; however, the sample was not immediately diluted and rerun. The sample was reprepped and reanalyzed after the error was discovered. The reanalysis took place one day after the holding time for the analysis had expired. See NCM SL-2900.

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:

Wade H. Price
Project Manager
e:\\priceS\abbydave\hanw1139.mar

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B96-139-2	~~Page 1 of 3~~ 1 of 3

Collector: R. Fahlberg	Company Contact: Scott Petersen	Telephone No.: 372-9574	Date Turnaround: 45 Days
Project Designation: 100D Ponds RCRA Closure	Sampling Location: 100 Area	SAF No.: B96-139	
Ice Chest No.: SML-519	Field Logbook No.: EL-1309	Method of Shipment: Hand Delivered	
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS: Unknown

Special Handling and/or Storage: Cool to 4C

SAMPLE ANALYSIS: 608307 SDG W01139

				Preservation	None	None	None	None	None				
				Type of Container	P	G	G	G	sG				
				No. of Container(s)	1	1	1	1	1				
				Volume	20ml	60ml	60ml	60ml	125ml				
					Activity Scan	Chromium Hex - 7196 608308	See item (1) in Special Instructions	Mercury - 7471 - (CV)	See item (2) in Special Instructions				
Sample No.	Matrix *		Sample Date	Sample Time									
01 BOHYS0	X	S	8-21-96	1020	X	X 100	X 100	X 100	X				
02 BOHYS1	X	S	8-21-96	1029	X	X	X	X	X				
03 BOHYS2	X	S	8-21-96	~~1052~~ 1052 RS	X	X	X	X	X				
04 BOHYS3	X	S	8-21-96	1052	X	X	X	X	X				
05 BOHYS4	X	S	8-21-96	1058	X	X	X	X	X				
06 BOHYS5	X	S	8-21-96	1110	X	X	X	X	X				
07 BOHYS6	X	S	8-21-96	1131	X	X	X	X	X				

CHAIN OF POSSESSION	Sign/Print Names	
Relinquished By: R. Fahlberg / R. Fahlberg	Date/Time: 8-21-96 1530	Received By: B. Whitten / B. Whitten
Relinquished By: B. Whitten / B. Whitten	Date/Time: 8-22-96 1330	Received By: Hudelberg
Relinquished By	Date/Time	Received By
Relinquished By	Date/Time	Received By

SPECIAL INSTRUCTIONS

** Hexavalent chrome at the Quanterra Laboratories must be extracted per SW-846 3060A with a holding time of 96 hours.

(1) ICP Metals - 6010A (TAL); Arsenic - 7060 - (FAA); Lead - 7421- (GFAA); Thallium - 7841 - (GFAA)

(2) Pest/PCBs - 8080 (TCL) (Aroclor-1254, Aroclor-1260)

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

1111104

00018

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B96-139-2	Page 1 of 2 of 3

Collector: R. Fahlberg / R. Fahlberg	Company Contact: Scott Petersen	Telephone No.: 372-9574	Data Turnaround: 45 Days
Project Designation: 100D Ponds RCRA Closure	Sampling Location: 100 Area	SAF No.: B96-139	
Ice Chest No.: SMC-519	Field Logbook No.: EL-1309	Method of Shipment: Hand Delivered	
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS: Unknown

Special Handling and/or Storage: Cool to 4C

SAMPLE ANALYSIS: 608307 SDG W01139

	Preservation	None	None	None	None	None								
	Type of Container	P	G	G	G	aG								
	No. of Container(s)	1	1	1	1	1								
	Volume	20ml	60ml	60ml	60ml	125ml								
		Activity Scan	Chromium Hex - 7196 608308	See Item (1) in Special Instructions	Mercury - 7471 - (CV)	See Item (2) in Special Instructions								
Sample No.	Matrix *	Sample Date	Sample Time											
08 BOHYS7	x S	8-21-96	1147	x	x	x	x	x						
09 BOHYS8	x S	8-21-96	1147	x	x	x	x	x						
10 BOHYS9	x S	8-21-96	1159	x	x	x	x	x						
11 BOHYT0	x S	8-21-96	1211	x	x	x	x	x						
12 BOHYT1	x S	8-21-96	1255	x	x	x	x	x						
13 BOHYT2	x S	8-21-96	1255	x	x	x	x	x						
14 BOHYT3	x S	8-21-96	1259	x	x	x	x	x						

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	1535 8-21-96	R. Whitten	1535 8-21-96
R. Whitten	1330 8-22-96	Heidelberg	8-22-96 1330

SPECIAL INSTRUCTIONS

** Hexavalent chrome at the Quanterra Laboratories must be extracted per SW-846 3060A with a holding time of 96 hours.

(1) ICP Metals - 6010A (TAL); Arsenic - 7060 - (FAA); Lead - 7421 - (GFAA); Thallium - 7841 - (GFAA)

(2) Pest/PCBs - 8080 (TCL) (Aroclor-1254, Aroclor-1260)

Matrix *

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

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

0014

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B96-139-2

Collector: R. Fahlberg	Company Contact: Scott Petersen	Telephone No.: 372-9574	Data Turnaround: 45 Days
Project Designation: 100D Ponds RCRA Closure	Sampling Location: 100 Area	SAF No.: B96-139	
Ice Chest No.: SML-519	Field Logbook No.: EL-1309	Method of Shipment: Hand Delivered	
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS: Unknown

Special Handling and/or Storage: Cool to 4C

Preservation	None	None	None	None	None						
Type of Container	P	G	G	G	aG						
No. of Container(s)	1	1	1	1	1						
Volume	20ml	60ml	60ml	60ml	125ml						
SAMPLE ANALYSIS	Activity Scan	Chromium Hex - 7196	See item (1) in Special Instructions.	Mercury - 7471 - (CV)	See item (2) in Special Instructions.						
	608307	608308									
		SDG W01139									

	Sample No.	Matrix *		Sample Date	Sample Time										
15	BOHYT4	x	S	8-21-96	1315	X	X	X	X	X					
16	BOHYT5	x	S	8-21-96	1332	X	X	X	X	X					
17	BOHYT6	x	S	8-21-96	1337	X	X	X	X	X					
18	BOHYT7	x	S	8-21-96	1350	X	X	X	X	X					
19	BOHYT8	x	S	8-21-96	1403	X	X	X	X	X					

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By	Date/Time 1530	Received By	Date/Time 1530
R. Fahlberg / R. Fahlberg	8-21-96	B. Whitten / B. Whitten	8-21-96
Relinquished By	Date/Time 1530	Received By	Date/Time
B. Whitten / B. Whitten	8-22-96	Heidelberg	8-22-96 1332
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

** Hexavalent chrome at the Quanterra Laboratories must be extracted per SW-846 3060A with a holding time of 96 hours.

(1) ICP Metals - 6010A (TAL); Arsenic - 7060 - (FAA); Lead - 7421 - (GFAA); Thallium - 7841 - (GFAA)

(2) Pest/PCBs - 8080 (TCL) (Aroclor-1254, Aroclor-1260)

Matrix *

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

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

0000144

A0220

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E
PROJECT: 100-D Ponds Verif. Sampling			DATA PACKAGE: W01139		
VALIDATOR: RBC		LAB: QES		DATE: 28 Oct 91	
CASE:			SDG: W01139-QES		
ANALYSES PERFORMED					
☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☐ SW-846/ICP	☐ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐
SAMPLES/MATRIX BOHY50, BOHY51, BOHY52, BOHY53					
BOHY54, BOHY55, BOHY56, BOHY57, BOHY58					
BOHY59, BOHYT0, BOHYT1, BOHYT2, BOHYT3					
BOHYT4, BOHYT5, BOHYT6, BOHYT7, BOHYT8					
water					

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No (N/A)

Is a case narrative present? . . . . . (Yes) No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes (No) N/A

Comments:

BOHY55 – Mercury – 29 days elapsed "J"

~~A-19~~ RBC

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

Were initial calibrations performed on all instruments? . . . . Yes No N/A
Are initial calibrations acceptable? . . . . . Yes No N/A
Are ICP interference checks acceptable? . . . . . Yes No N/A
Were ICV and CCV checks performed on all instruments? . . . . . Yes No N/A
Are ICV and CCV checks acceptable? . . . . . Yes No N/A

Comments:

4. BLANKS

Were ICB and CCB checks performed for all applicable analyses? Yes No N/A
Are ICB and CCB results acceptable? . . . . . Yes No N/A
Were preparation blanks analyzed? . . . . . Yes No N/A
Are preparation blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: Barium ~~[illegible]~~ det in IC + CC blanks - all results above 5X blk - ok

Iron det in CC blank - all results above 5X blk - ok

Iron, lead, manganese + zinc in FB above CRQL

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:

	MS	MSD	
Aluminum	147.4	160.1	J all but YSO
Manganese	140.4	570.9	~~[illegible] all but~~ J all
Thallium	44.3	50.3	J/UJ all
Barium		140.7	UJ all

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: Manganese outside QC limits – J detects
Serial dilution – Beryllium 100% Calcium 46.9 Mn 100
Sodium 100 Silver 100 Zinc 38.3
~~7 SOLIDL Mn – J all but 450~~ Calcium J all but 450
all other ok

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: Both 450 – 7. RSD 1437. – ok

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

HOLDING TIME SUMMARY

SDG: W0139	VALIDATOR: RPSC	DATE: 10/31/96	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
BOHYS5	Mercury	8/21/96	9/19/96	9/19/96		29	J

NOV 1996
RECEIVED
Validation
Log In

Date: 12 November 1996
To: Bechtel Hanford Inc. (technical representative)
From: A.T. Kearney, Inc.
Project: 100-D-Ponds Verification Sampling
Subject: Pesticide/PCB - Data Package No. W01139-QES (SDG No. W01139)

INTRODUCTION

This memo presents the results of data validation on Summary Data Package No. W01139-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
B0HYS0	08/21/96	Soil	D	EPA 8080
B0HYS1	08/21/96	Soil	D	EPA 8080
B0HYS2	08/21/96	Soil	D	EPA 8080
B0HYS3	08/21/96	Soil	D	EPA 8080
B0HYS4	08/21/96	Soil	D	EPA 8080
B0HYS5	08/21/96	Soil	D	EPA 8080
B0HYS6	08/21/96	Soil	D	EPA 8080
B0HYS7	08/21/96	Soil	D	EPA 8080
B0HYS8	08/21/96	Soil	D	EPA 8080
B0HYS9	08/21/96	Soil	D	EPA 8080
B0HYT0	08/21/96	Soil	D	EPA 8080
B0HYT1	08/21/96	Soil	D	EPA 8080
B0HYT2	08/21/96	Soil	D	EPA 8080
B0HYT3	08/21/96	Soil	D	EPA 8080
B0HYT4	08/21/96	Soil	D	EPA 8080
B0HYT5	08/21/96	Soil	D	EPA 8080
B0HYT6	08/21/96	Soil	D	EPA 8080
B0HYT7	08/21/96	Soil	D	EPA 8080
B0HYT8	08/21/96	Soil	D	EPA 8080

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1992a). Appendices 1 through 5 provide the following information as indicated below:

Appendix 1. Glossary of Data Reporting Qualifiers
Appendix 2. Summary of Data Qualification
Appendix 3. Qualified Data Summary and Annotated Laboratory Reports
Appendix 4. Laboratory Narrative and Chain-of-Custody Documentation
Appendix 5. Data Validation Supporting Documentation

DATA QUALITY OBJECTIVES

- **Holding Times**

Analytical holding times were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: Soil samples must be extracted within 14 days of the date of sample collection and analyzed within 40 days from the date of extraction.

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

Holding times were met for all samples.

- **Instrument Performance and Calibrations**

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 for the calibration factors are less than 20%. If the RSD is greater than 20%, detected results are qualified as estimates and flagged "J", and nondetects are qualified as estimates and flagged "UJ".

All calibration results were acceptable.

Calibration Verification

The criteria for acceptable continuing calibrations require that the calibration factors for all target compounds have percent difference of less than or equal to 15% of the average calibration factor calculated for the associated initial

calibration standard. If the percent difference for the continuing calibration is greater than 15%, all associated results for that compound are qualified as estimates and flagged "J" for detects and "UJ" for nondetects.

All 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 greater than CRQL. If target compounds are present, sample results less than five times the blank concentration are qualified as undetected and flagged "U". If the sample result is less than five times the blank concentration and less than CRQL, the result is qualified as undetected and elevated to the CRQL.

All method blank target compound results were acceptable.

Field Blanks

One field blank, sample number B0HYS0 was submitted for analysis. No target analytes were detected above the laboratory quantitation limit in the field blank sample.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate using six compounds and must be within the established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results less than five times the spike concentration are qualified as estimates and flagged "J". Nondetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results greater than five times the spike concentration require no qualification.

The matrix spike/matrix spike duplicate percent recoveries were outside QC limits for the following four analytes: heptachlor, aldrin, endrin, and dieldrin. Since all were nondetects, results for these analytes in all samples were qualfied as estimates and flagged "UJ".

All other matrix spike recovery results were acceptable.

Surrogate Recovery

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

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

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

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

Field Duplicate Samples

One pair of field duplicate samples were submitted to QES for analysis as shown below:

Sample No.	Duplicate Sample No.	Location
B0HYS7	B0HYS8	Settling Pond

The duplicate sample results were compared using the validation guidelines for determining the RPD between a sample and its duplicate. No target compounds were detected in either sample. Therefore, the precision results were acceptable.

- **System Performance**

  Compound Identification

  The identification 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 at the CRQL if no interferences are noted. If the misidentified peak interferes with a target peak then the reported value is qualified as an estimate and flagged "UJ". If detected results have not been analyzed on dissimilar columns, the results are rejected and flagged "UR".

  All compound identification results were acceptable.

- **Analytical Detection Levels**

  Reported analytical detection levels are compared against CRQLs to ensure that laboratory detection levels meet the required criteria. All analytical detection levels were acceptable.

- **Completeness**

  Data Package No. W01139-QES (SDG No. W01139) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

The matrix spike/matrix spike duplicate percent recovery was outside QC limits for the following analytes: heptachlor, aldrin, endrin, and dieldrin. Since all were nondetects, results for these analytes in all samples were qualfied as estimates and flagged "UJ". Data flagged "UJ" indicates that the associated detection limit is an estimate, but under WHC guidelines, the data may be usable for decision-making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

EPA, 1987, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, Environmental Protection Agency, Washington, D.C.

EPA, 1988a, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1988b, *Laboratory Data Validation Functional Guidelines for Evaluating Organics Analyses*, U.S. 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.

EPA, 1991, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, 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.

WHC, 1992b, *Data Validation Procedure for Radiological Analyses*, WHC-SD-EN-SPP-001, Rev. 2, Westinghouse Hanford Company, 1993.

EPA, 1994, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1994, *Validation Statement of Work*, Rev.1, Westinghouse Hanford Company, 1994.

Appendix 1

Glossary of Data Reporting Qualifiers

Qualifiers which may be applied by data validators in compliance with the procedures herein are as follows:

U - Indicates the compound or analyte was analyzed for and not detected in the sample. The value reported is the sample quantitation limit corrected for sample dilution and moisture content by the laboratory.

UJ - Indicates the compound or analyte was analyzed for and not detected in the sample. Due to a QC deficiency identified during the data validation, the associated quantitation limit is an estimate.

J - Indicates the compound or analyte was analyzed for and detected. The associated concentration is an estimate, but the data are usable for decision-making purposes.

R - Indicates the compound or analyte was analyzed for, detected, and due to an identified QC deficiency, the data are unusable.

UR - Indicates the compound or analyte was analyzed for and not detected in the sample. Additionally, the data is unusable due to an identified QC deficiency.

NJ - Indicates presumptive evidence of a compound at an estimated value. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

N - Indicates presumptive evidence of a compound. The data may not be valid for some specific applications (i.e., usable for decision-making purposes).

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W01139	REVIEWER: JAS	DATE: 11/12/96	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Heptachlor	UJ	B0HSY0, B0HYS1, B0HYS2, B0HYS3, B0HYS4, B0HYS5, B0HYS6, B0HYS7, B0HYS8, B0HYS9, B0HYT0, B0HYT1, B0HYT2, B0HYT3, B0HYT4, B0HYT5, B0HYT6, B0HYT7, B0HYT8	Matrix spike recovery below QC limits.
Aldrin	UJ	B0HYS0, B0HYS1, B0HYS2, B0HYS3, B0HYS4, B0HYS5, B0HYS6, B0HYS7, B0HYS8, B0HYS9, B0HYT0, B0HYT1, B0HYT2, B0HYT3, B0HYT4, B0HYT5, B0HYT6, B0HYT7, B0HYT8	Matrix spike recovery below QC limits.
Dieldrin	UJ	B0HSY0, B0HYS1, B0HYS2, B0HYS3, B0HYS4, B0HYS5, B0HYS6, B0HYS7, B0HYS8, B0HYS9, B0HYT0, B0HYT1, B0HYT2, B0HYT3, B0HYT4, B0HYT5, B0HYT6, B0HYT7, B0HYT8	Matrix spike recovery below QC limits.
Endrin	UJ	B0HSY0, B0HYS1, B0HYS2, B0HYS3, B0HYS4, B0HYS5, B0HYS6, B0HYS7, B0HYS8, B0HYS9, B0HYT0, B0HYT1, B0HYT2, B0HYT3, B0HYT4, B0HYT5, B0HYT6, B0HYT7, B0HYT8	Matrix spike recovery below QC limits.

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

PESTICIDE/PCB ANALYSIS, SOIL MATRIX, (ug/kg)

Project: BECHTEL-HANFORD																					
Laboratory: Quanterra																					
Case	SDG: W0113S9																				
Sample Number		B0HYS0		B0HYS1		B0HYS2		B0HYS3		B0HYS4		B0HYS5		B0HYS6		B0HYS7		B0HYS8		B0HYS9	
Location		Settling Pond		Settling Pond		Settling Pond		Test Pit		Settling Pond		Test Pit		Settling Pond		Settling Pond		Settling Pond		Settling Pond	
Remarks		Field Blank																Duplicate			
Sample Date		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96	
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	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
beta-BHC	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
delta-BHC	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
gamma-BHC (Lindane)	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
Heptachlor	1.8	1.7	UJ	1.8	UJ	1.7	UJ	1.8	UJ	1.7	UJ	1.8	UJ	1.8	UJ	1.7	UJ	1.7	UJ	1.8	UJ
Aldrin	1.8	1.7	UJ	1.8	UJ	1.7	UJ	1.8	UJ	1.7	UJ	1.8	UJ	1.8	UJ	1.7	UJ	1.7	UJ	1.8	UJ
Heptachlor Epoxide	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
Endosulfan I	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
Dieldrin	1.8	1.7	UJ	1.8	UJ	1.7	UJ	1.8	UJ	1.7	UJ	1.8	UJ	1.8	UJ	1.7	UJ	1.7	UJ	1.8	UJ
4,4'-DDE	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
Endrin	1.8	1.7	UJ	1.8	UJ	1.7	UJ	1.8	UJ	1.7	UJ	1.8	UJ	1.8	UJ	1.7	UJ	1.7	UJ	1.8	UJ
Endosulfan II	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
4,4'-DDD	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
Endosulfan Sulfate	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
4,4'-DDT	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
Endrin Aldehyde	1.8	1.7	U	1.8	U	1.7	U	1.8	U	1.7	U	1.8	U	1.8	U	1.7	U	1.7	U	1.8	U
Methoxychlor	3.6	3.3	U	3.5	U	3.4	U	3.5	U	3.5	U	3.6	U	3.6	U	3.5	U	3.4	U	3.6	U
Toxaphene	73	67	U	71	U	69	U	71	U	69	U	73	U	72	U	69	U	69	U	71	U
Chlordane	18	17	U	18	U	17	U	18	U	17	U	18	U	18	U	17	U	17	U	18	U
Aroclor-1016	36	33	U	35	U	34	U	36	U	35	U	36	U	36	U	35	U	34	U	36	U
Aroclor-1221	36	33	U	35	U	34	U	36	U	35	U	36	U	36	U	35	U	34	U	36	U
Aroclor-1232	36	33	U	35	U	34	U	36	U	35	U	36	U	36	U	35	U	34	U	36	U
Aroclor-1242	36	33	U	35	U	34	U	36	U	35	U	36	U	36	U	35	U	34	U	36	U
Aroclor-1248	36	33	U	35	U	34	U	36	U	35	U	36	U	36	U	35	U	34	U	36	U
Aroclor-1254	36	33	U	35	U	34	U	36	U	35	U	72		36	U	35	U	34	U	36	U
Aroclor-1260	36	33	U	35	U	34	U	36	U	35	U	36	U	36	U	35	U	34	U	36	U

00000123

PESTICIDE/PCB ANALYSIS, SOIL MATRIX, (ug/kg)

Project: BECHTEL-HANFORD																							
Laboratory: Quanterra																							
Case	SDG: W01139																						
Sample Number		B0HYT0		B0HYT1		B0HYT2		B0HYT3		B0HYT4		B0HYT5		B0HYT6		B0HYT7		B0HYT8			
Location		Settling Pond Bank		Settling Pond		Settling Pond		Percolation Pond		Percolation Pond		Percolation Pond		Percolation Pond		Percolation Pond		Percolation Pond			
Remarks																					
Sample Date		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96		08/21/96			
Pesticide/PCB	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
beta-BHC	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
delta-BHC	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
gamma-BHC (Lindane)	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
Heptachlor	1.8	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.6	UJ	1.7	UJ	1.6	UJ		
Aldrin	1.8	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.6	UJ	1.7	UJ	1.6	UJ		
Heptachlor Epoxide	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
Endosulfan I	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
Dieldrin	1.8	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.6	UJ	1.7	UJ	1.6	UJ		
4,4'-DDE	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
Endrin	1.8	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.7	UJ	1.6	UJ	1.7	UJ	1.6	UJ		
Endosulfan II	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
4,4'-DDD	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
Endosulfan Sulfate	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
4,4'-DDT	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
Endrin Aldehyde	1.8	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.7	U	1.6	U	1.7	U	1.6	U		
Methoxychlor	3.6	3.4	U	3.4	U	3.5	U	3.3	U	3.4	U	3.3	U	3.3	U	3.4	U	3.3	U		
Toxaphene	73	69	U	68	U	69	U	67	U	68	U	66	U	66	U	68	U	65	U		
Chlordane	18	17	U	17	U	17	U	17	U	17	U	17	U	16	U	17	U	16	U		
Aroclor-1016	36	34	U	34	U	35	U	33	U	34	U	33	U	33	U	34	U	33	U		
Aroclor-1221	36	34	U	34	U	35	U	33	U	34	U	33	U	33	U	34	U	33	U		
Aroclor-1232	36	34	U	34	U	35	U	33	U	34	U	33	U	33	U	34	U	33	U		
Aroclor-1242	36	34	U	34	U	35	U	33	U	34	U	33	U	33	U	34	U	33	U		
Aroclor-1248	36	34	U	34	U	35	U	33	U	34	U	33	U	33	U	34	U	33	U		
Aroclor-1254	36	34	U	34	U	35	U	33	U	34	U	33	U	33	U	34	U	33	U		
Aroclor-1260	36	34	U	34	U	35	U	33	U	34	U	33	U	33	U	34	U	33	U		

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0HYS0

Lab Name: QUANTERRA,MO Contract: 550-188

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-001

Sample wt/vol: 30.2 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 0 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U J
309-00-2	Aldrin	1.7	U J
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U J
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U J
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.3	U
8001-35-2	Toxaphene	67	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	33	U
11141-28-2	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12674-11-2	Aroclor-1016	33	U
12672-29-6	Aroclor-1248	33	U
11097-57-4	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

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

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
BOHYS2

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-003

Sample wt/vol: 30.2 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 4 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.4	U
8001-35-2	Toxaphene	69	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	34	U
11141-28-2	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12674-11-2	Aroclor-1016	34	U
12672-29-6	Aroclor-1248	34	U
11097-57-4	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U

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

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B0HYS1

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-002

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 6 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.8	U
319-85-7	beta-BHC	1.8	U
319-86-8	delta-BHC	1.8	U
58-89-9	gamma-BHC (Lindane)	1.8	U
76-44-8	Heptachlor	1.8	U J
309-00-2	Aldrin	1.8	U J
1024-57-3	Heptachlor epoxide	1.8	U
959-98-8	Endosulfan I	1.8	U
60-57-1	Dieldrin	1.8	U J
72-55-9	4,4'-DDE	1.8	U
72-20-8	Endrin	1.8	U J
33213-65-9	Endosulfan II	1.8	U
72-54-8	4,4'-DDD	1.8	U
1031-07-8	Endosulfan sulfate	1.8	U
50-29-3	4,4'-DDT	1.8	U
53494-70-5	Endrin Aldehyde	1.8	U
72-43-5	Methoychlor	3.5	U
8001-35-2	Toxaphene	71	U
57-74-9	Chlordane (technical)	18	U
11104-28-2	Aroclor-1221	35	U
11141-28-2	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12674-11-2	Aroclor-1016	35	U
12672-29-6	Aroclor-1248	35	U
11097-57-4	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U

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

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
BOHYS3

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-004

Sample wt/vol: 30.3 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 7 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.8	U
319-85-7	beta-BHC	1.8	U
319-86-8	delta-BHC	1.8	U
58-89-9	gamma-BHC (Lindane)	1.8	U
76-44-8	Heptachlor	1.8 J	U J
309-00-2	Aldrin	1.8 J	U J
1024-57-3	Heptachlor epoxide	1.8	U
959-98-8	Endosulfan I	1.8	U
60-57-1	Dieldrin	1.8 J	U J
72-55-9	4,4'-DDE	1.8	U
72-20-8	Endrin	1.8 J	U J
33213-65-9	Endosulfan II	1.8	U
72-54-8	4,4'-DDD	1.8	U
1031-07-8	Endosulfan sulfate	1.8	U
50-29-3	4,4'-DDT	1.8	U
53494-70-5	Endrin Aldehyde	1.8	U
72-43-5	Methoychlor	3.5	U
8001-35-2	Toxaphene	71	U
57-74-9	Chlordane (technical)	18	U
11104-28-2	Aroclor-1221	36	U
11141-28-2	Aroclor-1232	36	U
53469-21-9	Aroclor-1242	36	U
12674-11-2	Aroclor-1016	36	U
12672-29-6	Aroclor-1248	36	U
11097-57-4	Aroclor-1254	36	U
11096-82-5	Aroclor-1260	36	U

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

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOHYS4

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-005

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 4 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7 ~~4~~	U J
309-00-2	Aldrin	1.7 ~~4~~	U J
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7 ~~4~~	U J
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7 ~~4~~	U J
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.5	U
8001-35-2	Toxaphene	69	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	35	U
11141-28-2	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12674-11-2	Aroclor-1016	35	U
12672-29-6	Aroclor-1248	35	U
11097-57-4	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U

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

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
BOHYS5

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-006

Sample wt/vol: 30.5 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 10 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.8	U
319-85-7	beta-BHC	1.8	U
319-86-8	delta-BHC	1.8	U
58-89-9	gamma-BHC (Lindane)	1.8	U
76-44-8	Heptachlor	1.8 ~~J~~	U ~~J~~
309-00-2	Aldrin	1.8 ~~J~~	U ~~J~~
1024-57-3	Heptachlor epoxide	1.8	U
959-98-8	Endosulfan I	1.8	U
60-57-1	Dieldrin	1.8 ~~J~~	U ~~J~~
72-55-9	4,4'-DDE	1.8	U
72-20-8	Endrin	1.8 ~~J~~	U ~~J~~
33213-65-9	Endosulfan II	1.8	U
72-54-8	4,4'-DDD	1.8	U
1031-07-8	Endosulfan sulfate	1.8	U
50-29-3	4,4'-DDT	1.8	U
53494-70-5	Endrin Aldehyde	1.8	U
72-43-5	Methoychlor	3.6	U
8001-35-2	Toxaphene	73	U
57-74-9	Chlordane (technical)	18	U
11104-28-2	Aroclor-1221	36	U
11141-28-2	Aroclor-1232	36	U
53469-21-9	Aroclor-1242	36	U
12674-11-2	Aroclor-1016	36	U
12672-29-6	Aroclor-1248	36	U
11097-57-4	Aroclor-1254	72	
11096-82-5	Aroclor-1260	36	U

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

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
BOHYS6

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-007

Sample wt/vol: 30.1 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 7 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.8	U
319-85-7	beta-BHC	1.8	U
319-86-8	delta-BHC	1.8	U
58-89-9	gamma-BHC (Lindane)	1.8	U
76-44-8	Heptachlor	1.8 ~~J~~	U J
309-00-2	Aldrin	1.8 ~~J~~	U J
1024-57-3	Heptachlor epoxide	1.8	U
959-98-8	Endosulfan I	1.8	U
60-57-1	Dieldrin	1.8 ~~J~~	U J
72-55-9	4,4'-DDE	1.8	U
72-20-8	Endrin	1.8 ~~J~~	U J
33213-65-9	Endosulfan II	1.8	U
72-54-8	4,4'-DDD	1.8	U
1031-07-8	Endosulfan sulfate	1.8	U
50-29-3	4,4'-DDT	1.8	U
53494-70-5	Endrin Aldehyde	1.8	U
72-43-5	Methoychlor	3.6	U
8001-35-2	Toxaphene	72	U
57-74-9	Chlordane (technical)	18	U
11104-28-2	Aroclor-1221	36	U
11141-28-2	Aroclor-1232	36	U
53469-21-9	Aroclor-1242	36	U
12674-11-2	Aroclor-1016	36	U
12672-29-6	Aroclor-1248	36	U
11097-57-4	Aroclor-1254	36	U
11096-82-5	Aroclor-1260	36	U

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

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOHYS7

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-008

Sample wt/vol: 30.2 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 4 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U J
309-00-2	Aldrin	1.7	U J
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U J
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U J
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.5	U
8001-35-2	Toxaphene	69	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	35	U
11141-28-2	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12674-11-2	Aroclor-1016	35	U
12672-29-6	Aroclor-1248	35	U
11097-57-4	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U

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

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1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOHYS8

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-009

Sample wt/vol: 30.5 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 5 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.4	U
8001-35-2	Toxaphene	69	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	34	U
11141-28-2	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12674-11-2	Aroclor-1016	34	U
12672-29-6	Aroclor-1248	34	U
11097-57-4	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U

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

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1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOHYS9

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-010

Sample wt/vol: 30.5 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 8 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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	1.8	U
319-86-8	delta-BHC	1.8	U
58-89-9	gamma-BHC (Lindane)	1.8	U
76-44-8	Heptachlor	1.8	U
309-00-2	Aldrin	1.8	U
1024-57-3	Heptachlor epoxide	1.8	U
959-98-8	Endosulfan I	1.8	U
60-57-1	Dieldrin	1.8	U
72-55-9	4,4'-DDE	1.8	U
72-20-8	Endrin	1.8	U
33213-65-9	Endosulfan II	1.8	U
72-54-8	4,4'-DDD	1.8	U
1031-07-8	Endosulfan sulfate	1.8	U
50-29-3	4,4'-DDT	1.8	U
53494-70-5	Endrin Aldehyde	1.8	U
72-43-5	Methoychlor	3.6	U
8001-35-2	Toxaphene	71	U
57-74-9	Chlordane (technical)	18	U
11104-28-2	Aroclor-1221	36	U
11141-28-2	Aroclor-1232	36	U
53469-21-9	Aroclor-1242	36	U
12674-11-2	Aroclor-1016	36	U
12672-29-6	Aroclor-1248	36	U
11097-57-4	Aroclor-1254	36	U
11096-82-5	Aroclor-1260	36	U

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

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1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOHYTO

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-011

Sample wt/vol: 30.3 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 4 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.4	U
8001-35-2	Toxaphene	69	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	34	U
11141-28-2	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12674-11-2	Aroclor-1016	34	U
12672-29-6	Aroclor-1248	34	U
11097-57-4	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U

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

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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
BOHYT1

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-012

Sample wt/vol: 30.8 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 5 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.4	U
8001-35-2	Toxaphene	68	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	34	U
11141-28-2	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12674-11-2	Aroclor-1016	34	U
12672-29-6	Aroclor-1248	34	U
11097-57-4	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U

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

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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
BOHYT2

Lab Name: QUANTERRA,MO Contract: SSO-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-013

Sample wt/vol: 30.6 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 6 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U J
309-00-2	Aldrin	1.7	U J
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U J
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U J
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.5	U
8001-35-2	Toxaphene	69	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	35	U
11141-28-2	Aroclor-1232	35	U
53469-21-9	Aroclor-1242	35	U
12674-11-2	Aroclor-1016	35	U
12672-29-6	Aroclor-1248	35	U
11097-57-4	Aroclor-1254	35	U
11096-82-5	Aroclor-1260	35	U

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

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1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0HYT3

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix (soil/water) SOIL Lab Sample ID: 11923-014

Sample wt/vol: 30.2 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled: 08-21-96

% Moisture: not dec. 1 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U J
309-00-2	Aldrin	1.7	U J
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U J
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U J
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.3	U
8001-35-2	Toxaphene	67	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	33	U
11141-28-2	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12674-11-2	Aroclor-1016	33	U
12672-29-6	Aroclor-1248	33	U
11097-57-4	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

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

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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B0HYT4

Lab Name: QUANTERRA,MO Contract: SSO-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-015

Sample wt/vol: 30.5 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 3 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U J
309-00-2	Aldrin	1.7	U J
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U J
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U J
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.4	U
8001-35-2	Toxaphene	68	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	34	U
11141-28-2	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12674-11-2	Aroclor-1016	34	U
12672-29-6	Aroclor-1248	34	U
11097-57-4	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U

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

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1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOHYTS

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-016

Sample wt/vol: 30.4 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 1 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.3	U
8001-35-2	Toxaphene	66	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	33	U
11141-28-2	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12674-11-2	Aroclor-1016	33	U
12672-29-6	Aroclor-1248	33	U
11097-57-4	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

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

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOHYT6

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-017

Sample wt/vol: 30.6 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 1 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.6	U
319-85-7	beta-BHC	1.6	U
319-86-8	delta-BHC	1.6	U
58-89-9	gamma-BHC (Lindane)	1.6	U
76-44-8	Heptachlor	1.6	U J
309-00-2	Aldrin	1.6	U J
1024-57-3	Heptachlor epoxide	1.6	U
959-98-8	Endosulfan I	1.6	U
60-57-1	Dieldrin	1.6	U J
72-55-9	4,4'-DDE	1.6	U
72-20-8	Endrin	1.6	U J
33213-65-9	Endosulfan II	1.6	U
72-54-8	4,4'-DDD	1.6	U
1031-07-8	Endosulfan sulfate	1.6	U
50-29-3	4,4'-DDT	1.6	U
53494-70-5	Endrin Aldehyde	1.6	U
72-43-5	Methoychlor	3.3	U
8001-35-2	Toxaphene	66	U
57-74-9	Chlordane (technical)	16	U
11104-28-2	Aroclor-1221	33	U
11141-28-2	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12674-11-2	Aroclor-1016	33	U
12672-29-6	Aroclor-1248	33	U
11097-57-4	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

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

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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B0HYT7

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-018

Sample wt/vol: 30.4 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 3 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.7	U
319-85-7	beta-BHC	1.7	U
319-86-8	delta-BHC	1.7	U
58-89-9	gamma-BHC (Lindane)	1.7	U
76-44-8	Heptachlor	1.7	U
309-00-2	Aldrin	1.7	U
1024-57-3	Heptachlor epoxide	1.7	U
959-98-8	Endosulfan I	1.7	U
60-57-1	Dieldrin	1.7	U
72-55-9	4,4'-DDE	1.7	U
72-20-8	Endrin	1.7	U
33213-65-9	Endosulfan II	1.7	U
72-54-8	4,4'-DDD	1.7	U
1031-07-8	Endosulfan sulfate	1.7	U
50-29-3	4,4'-DDT	1.7	U
53494-70-5	Endrin Aldehyde	1.7	U
72-43-5	Methoychlor	3.4	U
8001-35-2	Toxaphene	68	U
57-74-9	Chlordane (technical)	17	U
11104-28-2	Aroclor-1221	34	U
11141-28-2	Aroclor-1232	34	U
53469-21-9	Aroclor-1242	34	U
12674-11-2	Aroclor-1016	34	U
12672-29-6	Aroclor-1248	34	U
11097-57-4	Aroclor-1254	34	U
11096-82-5	Aroclor-1260	34	U

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

FORM I PEST 1/87 Rev.

10/29/96

000031

~~0148~~

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
BOHYT8

Lab Name: QUANTERRA,MO Contract: 550-168

Lab Code: ITMO Case No.: _____ SAS No.: _____ SDG No.: W01139

Matrix: (soil/water) SOIL Lab Sample ID: 11923-019

Sample wt/vol: 30.7 (g/ml) G Lab File ID: _____

Level: (low/med) LOW Date Sampled : 08-21-96

% Moisture: not dec. 0 dec. _____ Date Extracted: 09-04-96

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 09-19-96

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

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

CAS NO.	Compound		Q
319-84-6	alpha-BHC	1.6	U
319-85-7	beta-BHC	1.6	U
319-86-8	delta-BHC	1.6	U
58-89-9	gamma-BHC (Lindane)	1.6	U
76-44-8	Heptachlor	1.6	U J
309-00-2	Aldrin	1.6	U J
1024-57-3	Heptachlor epoxide	1.6	U
959-98-8	Endosulfan I	1.6	U
60-57-1	Dieldrin	1.6	U J
72-55-9	4,4'-DDE	1.6	U
72-20-8	Endrin	1.6	U J
33213-65-9	Endosulfan II	1.6	U
72-54-8	4,4'-DDD	1.6	U
1031-07-8	Endosulfan sulfate	1.6	U
50-29-3	4,4'-DDT	1.6	U
53494-70-5	Endrin Aldehyde	1.6	U
72-43-5	Methoychlor	3.3	U
8001-35-2	Toxaphene	65	U
57-74-9	Chlordane (technical)	16	U
11104-28-2	Aroclor-1221	33	U
11141-28-2	Aroclor-1232	33	U
53469-21-9	Aroclor-1242	33	U
12674-11-2	Aroclor-1016	33	U
12672-29-6	Aroclor-1248	33	U
11097-57-4	Aroclor-1254	33	U
11096-82-5	Aroclor-1260	33	U

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

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~~0132~~

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

Quanterra
Environmental Services

CERTIFICATE OF ANALYSIS

Bechtel Hanford Incorporated
3350 George Washington Way
Richland, Washington 99352

OCT 1996
RECEIVED
Data
Log In

September 27, 1996

Attention: Joan Kessner

Project number	:	550.168
Date Received by Lab	:	August 22, 1996
Number of Samples	:	Nineteen (19)
Sample Type	:	Soil
SDG Number	:	W01139
Data Deliverable	:	Standalone

I. Introduction

On August 22, 1996, nineteen (19) soil samples were received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analysis. Upon receipt, the samples were given the following laboratory ID numbers to correspond with the specific client IDs:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
11923-001	B0HYS0	60830701	Soil	08/22/96
11923-002	B0HYS1	60830702	Soil	08/22/96
11923-003	B0HYS2	60830703	Soil	08/22/96
11923-004	B0HYS3	60830704	Soil	08/22/96
11923-005	B0HYS4	60830705	Soil	08/22/96
11923-006	B0HYS5	60830706	Soil	08/22/96
11923-007	B0HYS6	60830707	Soil	08/22/96
11923-008	B0HYS7	60830708	Soil	08/22/96
11923-009	B0HYS8	60830709	Soil	08/22/96
11923-010	B0HYS9	60830710	Soil	08/22/96
11923-011	B0HYT0	60830711	Soil	08/22/96
11923-012	B0HYT1	60830712	Soil	08/22/96
11923-013	B0HYT2	60830713	Soil	08/22/96
11923-014	B0HYT3	60830714	Soil	08/22/96

Bechtel Hanford Incorporated
September 27,1996
Project Number: 550.150
SDG: W01139
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St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
11923-015	B0HYT4	60830715	Soil	08/22/96
11923-016	B0HYT5	60830716	Soil	08/22/96
11923-017	B0HYT6	60830717	Soil	08/22/96
11923-018	B0HYT7	60830718	Soil	08/22/96
11923-019	B0HYT8	60830719	Soil	08/22/96

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.

Analyses requested: TCL Pesticide/PCBs by EPA method 8080. TAL ICP Metals by EPA method 6010. Mercury by EPA method 7471. Arsenic by EPA method 7060. Lead by EPA method 7421. Thallium by EPA method 7841. Hexavalent Chromium by EPA method 7196 was performed by QTESRL, the data is included in this package.

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. Matrix Spike and Matrix Spike Duplicate analyses were performed per the protocol for each analyte.

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

Shipping and Receiving
There are no comments or nonconformances associated with the shipping and receiving of these samples.

Pesticide/PCBs
There were retention time shifts for some of the target compounds in a few of the continuing calibration checks. This shift, however, does not affect the reported results, for all the samples associated with these calibration checks were nondetect for the affected target compounds. Sample 11923-006 did have a positive hit for a PCB. However, PCB's are identified more by pattern recognition than by retention time.

Metals
The recoveries of the matrix spikes and/or the matrix spike duplicates for the following list of elements was not within the 80%-120% range , therefore all associated data was flagged with a " N ".

	%REC MS	%REC MSD
Thallium	44.3	53.0
Aluminum	147.4	160.1
Manganese	140.4	571
Barium	104.4*	140.7

* Meets criteria-for reference only

The recoveries of the Iron matrix spike and matrix spike duplicate were also less than 80% but did not require a flag because the sample concentration was greater than 4 X the spiking level.

Bechtel Hanford Incorporated
September 27,1996
Project Number: 550.150
SDG: W01139
Page 4

The percent difference for the Calcium serial dilution (46.9) was greater than 10 which is indicated on the forms by the " E " flag.

Sample 11923-006 gave Mercury results above the calibration range upon initial analysis; however, the sample was not immediately diluted and rerun. The sample was reprepped and reanalyzed after the error was discovered. The reanalysis took place one day after the holding time for the analysis had expired. See NCM SL-2900.

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:

Wade H. Price
Project Manager
e:\\price5\abbydave\hanw1139.nar

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B96-139-2	~~Page 1 of 3~~ 1 of 3

Collector: R. Fahlberg	Company Contact: Scott Petersen	Telephone No.: 372-9574	Data Turnaround: 45 Days
Project Designation: 100D Ponds RCRA Closure	Sampling Location: 100 Area	SAF No.: B96-139	
Ice Chest No.: SML-519	Field Logbook No.: EL-1309	Method of Shipment: Hand Delivered	
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS: Unknown

Special Handling and/or Storage: Cool to 4C

SAMPLE ANALYSIS: 608307 SDG W01139

Preservation	None	None	None	None	None
Type of Container	P	G	G	G	sG
No. of Container(s)	1	1	1	1	1
Volume	20ml	60ml	60ml	60ml	125ml
	Activity Scan	Chromium Hex - 7196 (608308)	See item (1) in Special Instructions	Mercury - 7471 - (CV)	See item (2) in Special Instructions

Sample No.	Matrix *	Sample Date	Sample Time	Activity Scan	Chromium Hex - 7196	See item (1) in Special Instructions	Mercury - 7471 - (CV)	See item (2) in Special Instructions
01 BOHYS0	X S	8-21-96	1020	X	X 100	X 100	X 100	X
02 BOHYS1	X S	8-21-96	1029	X	X	X	X	X
03 BOHYS2	X S	8-21-96	~~1052~~ 1052 RS	X	X	X	X	X
04 BOHYS3	X S	8-21-96	1052	X	X	X	X	X
05 BOHYS4	X S	8-21-96	1058	X	X	X	X	X
06 BOHYS5	X S	8-21-96	1110	X	X	X	X	X
07 BOHYS6	X S	8-21-96	1131	X	X	X	X	X

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: R. Fahlberg / R. Fahlberg	Date/Time: 8-21-96 1530	Received By: B. Whitten	Date/Time: 8-21-96 1530
Relinquished By: B. Whitten	Date/Time: 8-22-96 1330	Received By: Heidelberg	Date/Time: 8-22-96 1330
Relinquished By	Date/Time	Received By	Date/Time
Relinquished By	Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

** Hexavalent chrome at the Quanterra Laboratories must be extracted per SW-846 3060A with a holding time of 96 hours.

(1) ICP Metals - 6010A (TAL); Arsenic - 7060 - (FAA); Lead - 7421 - (GFAA); Thallium - 7841 - (GFAA)

(2) Pest/PCBs - 8080 (TCL) (Aroclor-1254, Aroclor-1260)

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

000182

Bechtel Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	B96-139-2	Page 1 of 1 2 of 3

Collector: R. Fahlberg / R. Fahlberg	Company Contact: Scott Petersen	Telephone No.: 372-9574	Data Turnaround: 45 Days
Project Designation: 100D Ponds RCRA Closure	Sampling Location: 100 Area	SAF No.: B96-139	
Ice Chest No.: SMC-519	Field Logbook No.: EL-1309	Method of Shipment: Hand Delivered	
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.	
POSSIBLE SAMPLE HAZARDS/REMARKS: Unknown			
Special Handling and/or Storage: Cool to 4C			

SAMPLE ANALYSIS: 608307 SDG W01139

	Preservation	None	None	None	None	None					
	Type of Container	P	G	G	G	aG					
	No. of Container(s)	1	1	1	1	1					
	Volume	20ml	60ml	60ml	60ml	125ml					
		Activity Scan	Chromium Hex - 7196 608308	See item (1) in Special Instructions	Mercury - 7471 - (CV)	See item (2) in Special Instructions					

	Sample No.	Matrix *		Sample Date	Sample Time										
08	BOHYS7	X	S	8.21.96	1147	X	X	X	X	X					
09	BOHYS8	X	S	8.21.96	1147	X	X	X	X	X					
10	BOHYS9	X	S	8.21.96	1159	X	X	X	X	X					
11	BOHYT0	X	S	8.21.96	1211	X	X	X	X	X					
12	BOHYT1	X	S	8.21.96	1255 BW	X	X	X	X	X					
13	BOHYT2	X	S	8.21.96	1255 BW	X	X	X	X	X					
14	BOHYT3	X	S	8.21.96	1259 BW	X	X	X	X	X					

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	R. Fahlberg / R. Fahlberg	8.21.96 1535	Received By: B. Whitten	8-21-96 1535
Relinquished By	R. Whitten	8-22-96 1330	Received By: Heidelberg	8-22-96 1330
Relinquished By		Date/Time	Received By	Date/Time
Relinquished By		Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

** Hexavalent chrome at the Quanterra Laboratories must be extracted per SW-846 3060A with a holding time of 96 hours.

(1) ICP Metals - 6010A (TAL); Arsenic - 7060 - (FAA); Lead - 7421 - (GFAA); Thallium - 7841 - (GFAA)

(2) Pest/PCBs - 8080 (TCL) (Aroclor-1254, Aroclor-1260)

Matrix *

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

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

00148

Bechtel Hanford Inc.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

B96-139-2

Collector: R. Fahlberg	Company Contact: Scott Petersen	Telephone No.: 372-9574	Data Turnaround: 45 Days
Project Designation: 100D Ponds RCRA Closure	Sampling Location: 100 Area	SAF No.: B96-139	
Ice Chest No.: SMC-519	Field Logbook No.: EL-1309	Method of Shipment: Hand Delivered	
Shipped To: Quanterra	Offsite Property No.	Bill of Lading/Air Bill No.	

POSSIBLE SAMPLE HAZARDS/REMARKS: Unknown

Special Handling and/or Storage: Cool to 4C

SAMPLE ANALYSIS: 608307 SDG W01139

Preservation	None	None	None	None	None					
Type of Container	P	G	G	G	nG					
No. of Container(s)	1	1	1	1	1					
Volume	20ml	60ml	60ml	60ml	125ml					
	Activity Scan	Chromium Hex - 7196 (608308)	See Item (1) in Special Instructions.	Mercury - 7471 - (CV)	See Item (2) in Special Instructions.					

	Sample No.	Matrix *		Sample Date	Sample Time	Activity Scan	Chromium Hex - 7196	See Item (1)	Mercury - 7471 - (CV)	See Item (2)					
15	BOHYT4	X	S	8-21-96	1315	X	X	X	X	X					
16	BOHYT5	X	S	8-21-96	1332	X	X	X	X	X					
17	BOHYT6	X	S	8-21-96	1337	X	X	X	X	X					
18	BOHYT7	X	S	8-21-96	1350	X	X	X	X	X					
19	BOHYT8	X	S	8-21-96	1403	X	X	X	X	X					

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
R. Fahlberg / R. Fahlberg	8-21-96 1530	B. Whitten / B. Whitten	8-21-96 1530
B. Whitten / B. Whitten	8-22-96 1530	Heidelberg	8-22-96 1330

SPECIAL INSTRUCTIONS

** Hexavalent chrome at the Quanterra Laboratories must be extracted per SW-846 3060A with a holding time of 96 hours.

(1) ICP Metals - 6010A (TAL); Arsenic - 7060 - (FAA); Lead - 7421- (GFAA); Thallium - 7841 - (GFAA)

(2) Pest/PCBs - 8080 (TCL) (Aroclor-1254, Aroclor-1260)

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:

Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: Bechtel Hanford	DATA PACKAGE:	
VALIDATOR: Julie Shanahan	LAB: Quanterra	DATE: 10-28-96
CASE:	SDG: W01139	

ANALYSES PERFORMED

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

SAMPLES/MATRIX

BOHYS0, BOHYS1, BOHYS2, BOHYS3, BOHYS4, BOHYS5, BOHYS6, BOHYS7, BOHYS8, BOHYS9, BOHYT0, BOHYT1, BOHYT2, BOHYT3, BOHYT4, BOHYT5, BOHYT6, BOHYT7, BOHYT8 (SOIL)

1. DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

Is technical verification documentation present? . . . . . Yes No N/A

Is a case narrative present? . . . . . Yes No N/A

Comments:

2. HOLDING TIMES

Are sample holding times acceptable? . . . . . Yes No N/A

Comments:

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

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

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

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

PESTICIDE/PCB DATA VALIDATION CHECKLIST

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

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

Comments:

3.2 CALIBRATIONS (METHOD 8080 AND 8081)

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

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

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

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

Comments: All %RSD are ≤20% ∴ w/i criteria
All %D are ≤20% ∴ w/i criteria

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

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

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

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

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

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

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

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

Comments:

3.4 CALIBRATION VERIFICATION (3/90 SOW)

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

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

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

PESTICIDE/PCB DATA VALIDATION CHECKLIST

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

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

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

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

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

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

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

Comments:

4. BLANKS

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

Are laboratory blank results acceptable? . . . . . Yes No N/A

Were field/trip blanks analyzed? . . . . . Yes No N/A

Are field/trip blank results acceptable? . . . . . Yes No N/A

Comments: No DETECTS in Blank

5. ACCURACY

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

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

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

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

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

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

Comments: Several of the MS/MSD % REC calculations were incorrect. MSD % REC for Dieldrin reported as 62%, however after calcs. should be 59%. MSD % REC for 4,4'-DDT reported as 75%, however should be 71%. Several MS/MSD % REC not w/i QC criteria → MS % REC heptachlor 63% QC limits (70-123); MS % REC Aldrin (58%) QC limits (69-136); MS % REC Endrin (71%) QC limits (76-131); MSD % REC heptachlor (61%) QC limits (70-123); MSD % REC Aldrin (58%) QC limits (69-136); MSD % REC Dieldrin (59%) QC limits (62-117); MSD % REC Endrin (70%) QC limits (76-131)

∴ These compounds for All samples will be flagged UJ – "Estimated"

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:

ACCURACY DATA SUMMARY

SDG: W01139	VALIDATOR: JAS	DATE: 10/31/96	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
~~ATP~~ BOH4S0	heptachlor	(MS) 63	All	J
	aldrin	(MS) 58	All	J
	endrin	(MS) 71	All	J
	dieldrin	(MSD) 59	All	J
	heptachlor	(MSD) 61	all	J
	Aldrin	(MSD) 58	all	J
	Endrin	(MSD) 70	all	J