START 9613451.0866

0044542

Quanterra Environmental Services

W0430

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

MAR 1995 RECEIVED Data Log In

Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

March 16, 1995

Attention: Joan Kessner

JUN 1996 RECEIVED EDMC

SAF Number	:	B94-098
Date SDG Closed	:	January 30, 1995
Number of Samples	:	One (1) - See ROD-B95-013
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Stand Alone

I. Introduction

On January 30, and February 1, 1995, a total of nineteen soil samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. After receipt, per ROD-B95-013, the samples were split into two separate SDGs for reporting purposes. The samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QTESRL ID	BHI ID	Matrix	Date of Receipt
50151812	B0DMT4	Soil	1/30/95

II. Analytical Results/Methodology

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

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The requested analyses were:

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

III. Quality Control

The analytical results for each analysis performed under SDG W0430 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

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

IV. Comments

Samples submitted as a single SDG, SDG W0403 (stand alone), were split into two SDGs after analysis had been started, W0403 (summary) and W0430 (stand alone), as per ROD-B95-013.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
The LCS, batch blank, sample and sample duplicate (B0DMR7, SDG W0403) results are within contractual requirements.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The batch was analyzed with two LCS samples. The soil lab is undergoing an investigation into the cause of a low spike bias for water spikes prepared in that area, and is preparing duplicate spikes for soil batches. LCS M015182S, which contains an iron carrier, is not used for reporting purposes. The LCS samples were recounted due to unacceptable recoveries and the recount result is accepted for M015181S. The LCS, batch blank, sample and sample duplicate (B0DMR6, SDG W0403) results are within contractual requirements, except as noted.

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Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (B0DMR6, SDG W0403) results are within contractual requirements.

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

Reviewed and approved:

Suzanne Gaines

Suzanne Gaines
Project Manager

Quanterra
Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0430
LAB SAMPLE ID:	50151812	MATRIX:	SOIL
CLIENT ID:	B0DMT4	DATE RECEIVED:	1/30/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
CO-58	4.35E-03	1.2E-02	1.2E-02	2.06E-02	pCi/g	N/A	RD3219
CO-60	1.19E-02	1.0E-02	1.0E-02	1.90E-02	pCi/g	N/A	RD3219
CS-137DA	2.54E-02	1.4E-02	1.4E-02	N/A	pCi/g	N/A	RD3219
EU-152	1.86E-02	2.6E-02	2.6E-02	4.23E-02	pCi/g	N/A	RD3219
EU-154	-5.84E-03	3.1E-02	3.1E-02	5.33E-02	pCi/g	N/A	RD3219
EU-155	3.01E-02	2.2E-02	2.3E-02	3.84E-02	pCi/g	N/A	RD3219
FE-59	-4.77E-02	3.3E-02	3.4E-02	5.04E-02	pCi/g	N/A	RD3219
K-40	9.42E+00	4.3E-01	1.0E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	4.14E-01	2.8E-02	5.0E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	3.67E-01	4.0E-02	5.5E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	4.42E-01	6.7E-02	8.0E-02	N/A	pCi/g	N/A	RD3219
ALPHA	1.90E+00	2.7E+00	2.7E+00	5.34E+00	pCi/g	100.00%	RD3222
BETA	1.59E+01	3.0E+00	3.2E+00	3.66E+00	pCi/g	100.00%	RD3222

Number of Results: 13

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DUPLICATE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0430
LAB SAMPLE ID:	G0151804	MATRIX:	SOIL
CLIENT ID:	B0DMS4	DATE RECEIVED:	1/30/95
ORIG LAB SAMPLE ID:	50151804		

ISOTOPE	DUP RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
ALPHA	2.13E+01	6.4E+00	6.8E+00	4.21E+00	pCi/g	100.00%	RD3222	2.14E+01	0.47%
BETA	2.08E+01	3.3E+00	3.6E+00	3.64E+00	pCi/g	100.00%	RD3222	2.36E+01	12.61%

Number of Results: 2

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Environmental Services

DUPLICATE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0430
LAB SAMPLE ID:	G0151805	MATRIX:	SOIL
CLIENT ID:	B0DMR7	DATE RECEIVED:	1/30/95
ORIG LAB SAMPLE ID:	50151805		

ISOTOPE	DUP RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER	ORIG RESULT	RPD
CO-58	-6.25E-03	1.3E-02	1.3E-02	2.04E-02	pCi/g	N/A	RD3219	1.19E-02	642.48%
CO-60	2.32E-02	1.1E-02	1.1E-02	2.10E-02	pCi/g	N/A	RD3219	2.13E-02	8.54%
CS-137DA	6.81E-02	1.6E-02	1.8E-02	N/A	pCi/g	N/A	RD3219	5.80E-02	16.02%
EU-152	3.11E-02	2.8E-02	2.8E-02	4.63E-02	pCi/g	N/A	RD3219	2.37E-03	171.68%
EU-154	1.46E-02	3.6E-02	3.6E-02	6.10E-02	pCi/g	N/A	RD3219	2.10E-02	35.96%
EU-155	2.64E-02	3.0E-02	3.0E-02	4.68E-02	pCi/g	N/A	RD3219	4.55E-02	53.13%
FE-59	1.53E-02	3.3E-02	3.3E-02	5.66E-02	pCi/g	N/A	RD3219	-2.74E-02	705.79%
K-40	9.21E+00	4.7E-01	1.0E+00	N/A	pCi/g	N/A	RD3219	8.41E+00	9.08%
RA-224DA	4.97E-01	3.3E-02	6.0E-02	N/A	pCi/g	N/A	RD3219	4.12E-01	18.70%
RA-226DA	4.69E-01	5.3E-02	7.1E-02	N/A	pCi/g	N/A	RD3219	3.83E-01	20.19%
RA-228DA	3.86E-01	7.6E-02	8.5E-02	N/A	pCi/g	N/A	RD3219	4.59E-01	17.28%

Number of Results: 11

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BLANK RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0430
LAB SAMPLE ID:	M015181B	MATRIX:	SOIL

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
ALPHA	-3.17E-02	5.1E-02	5.1E-02	1.59E-01	pCi/sa	100.00%	RD3222
BETA	8.77E-03	3.6E-01	3.6E-01	8.60E-01	pCi/sa	100.00%	RD3222

Number of Results: 2

Quanterra
Environmental Services

BLANK RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0430
LAB SAMPLE ID:	M015181X	MATRIX:	SOIL

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
CO-58	1.09E-02	7.8E-03	7.8E-03	1.45E-02	pCi/g	N/A	RD3219
CO-60	6.44E-03	6.1E-03	6.1E-03	1.19E-02	pCi/g	N/A	RD3219
CS-137DA	1.05E-03	6.9E-03	6.9E-03	1.20E-02	pCi/g	N/A	RD3219
EU-152	-4.91E-03	1.8E-02	1.8E-02	2.83E-02	pCi/g	N/A	RD3219
EU-154	3.11E-03	2.0E-02	2.0E-02	3.45E-02	pCi/g	N/A	RD3219
EU-155	-1.53E-03	1.7E-02	1.7E-02	2.69E-02	pCi/g	N/A	RD3219
FE-59	7.28E-03	1.8E-02	1.8E-02	3.12E-02	pCi/g	N/A	RD3219

Number of Results: 7

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LABORATORY CONTROL SAMPLE

LAB NAME:	ITAS-RICHLAND	**SDG:**	W0430
LAB SAMPLE ID:	M015181M	**MATRIX:**	SOIL

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	EXPECTED	RECOVERY
CS-137DA	3.76E-01	4.4E-02	5.8E-02	N/A	pCi/g	N/A	3.45E-01	108.99%
K-40	2.06E+01	8.3E-01	2.2E+00	N/A	pCi/g	N/A	1.95E+01	105.64%
RA-226DA	1.07E+00	8.0E-02	1.3E-01	N/A	pCi/g	N/A	1.16E+00	92.24%
RA-228DA	2.11E+00	1.7E-01	2.7E-01	N/A	pCi/g	N/A	1.87E+00	112.83%

Number of Results: 4

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Environmental Services

LABORATORY CONTROL SAMPLE

LAB NAME:	ITAS-RICHLAND	SDG:	W0430
LAB SAMPLE ID:	M015181S	MATRIX:	SOIL

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	EXPECTED	RECOVERY
ALPHA	3.27E+00	3.6E-01	6.6E-01	1.02E-01	pCi/sa	100.00%	4.55E+00	71.87%
BETA	1.36E+01	1.1E+00	1.5E+00	7.68E-01	pCi/sa	100.00%	1.35E+01	100.74%

Number of Results: 2

Quanterra
Environmental Services

LABORATORY CONTROL SAMPLE

LAB NAME:	ITAS-RICHLAND	SDG:	W0430
LAB SAMPLE ID:	M015182S	MATRIX:	SOIL

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	EXPECTED	RECOVERY
ALPHA	1.59E+00	3.4E-01	4.0E-01	1.91E-01	pCi/sa	100.00%	4.50E+00	35.33%

Number of Results: 1

3/18/95

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INTERNATIONAL TECHNOLOGY CORPORATION

ITAS Data Review Checklist
RADIOCHEMISTRY

Work Order No(s): 501518, 502020

Lab Sample Numbers or SDG: WO 403

Method/Test/Parameter: Gamma RD3219

	Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level review (✓)
A. 1.	**Calibration** Is the calibration documentation included where applicable?			✓	✓
B. 1.	**Sample Analysis** Are the sample Yields within acceptance criteria?			✓	✓
2.	Were all sample holding times met?	✓			✓
C. 1.	**QC Samples** Is the Blank Yield within acceptance criteria?			✓	✓
2.	Is the Minimum Detectable Activity for the Blank result ≤ the Contract Detection Limit?	✓			✓
3.	Is the Blank result ≤ the Contract Detection Limit?	✓			✓
4.	Is the Blank result greater than the Contract Detection Limit but the Sample result less than the Contract Detection Limit?			✓	✓
5.	Is the LCS result within acceptance criteria?	✓			✓
6.	Is the LCS yield within acceptance criteria?			✓	✓
7.	Is the LCS Minimum Detectable Activity less than or equal to the Contract Detection Limit?			✓	✓
8.	MS/MSD results and yield meet acceptance criteria?			✓	✓
9.	Duplicate sample results and yield meet acceptance criteria?	✓			✓
D. 1.	**Other** Are all nonconformances included and noted?	✓			✓
2.	Are all required forms filled out?	✓			✓
3.	Correct methodology used?	✓			✓
4.	Transcription checked?	✓			✓
5.	Were all calculations checked at a minimum frequency?	✓			✓
6.	Units checked?	✓			✓

Comments on any "No" response: 2 NCMS 1- MDA's > CL
2- peaks reported not detected

Analyst: [signature] Date: 3-10-95

Second Level Review: [signature] Date: 3/16/95

Form No: RS-038, 3/94, Rev 2

Report isotopes as listed at the bottom of each spectrum, all samples
: report BHI "7".

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Quanterra

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

PROJECT ID (Name/Number): BHI 400403/430
NCM INITIATED BY (Name/Date): Joel T Kempema 3-10-95
PARAMETER(S): Gamma
SAMPLE NUMBER(S) AFFECTED: 50151804, 60151805, 50151806, 07, 09, 14
MATRIX: Soil

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

NONCONFORMANCE [check appropriate item(s)]:

1. ☐ Not enough sample received for proper analysis.
2. ☐ Holding time exceeded by _____ days due to:
   - 2.1 ☐ CATEGORY I: Out of Laboratory Control
     - ☐ Holding time expired at receipt.
   - 2.2 ☐ CATEGORY II: Laboratory Dependent
     - ☐ work backlog ☐ instrument failure
     - ☐ communication ☐ other (see #10)
   - 2.3 ☐ CATEGORY III: Laboratory Reruns
     - 2.3.1 ☐ QA/QC:
       - ☐ surrogates ☐ internal standards
       - ☐ spike recoveries ☐ blank contamination
     - 2.3.2 ☐ CONFIRMATION:
       - ☐ second column ☐ contamination check
       - ☐ other (see #10)
     - 2.3.3 ☐ DILUTION:
       - ☐ over calibration ☐ under calibration
       - ☐ other (see #10)
     - 2.3.4 ☐ OTHER: (see #10)
3. ☐ Sample lost during extraction/analysis; no re-prep or re-analysis possible.
4. ☐ QC data reported to client outside of:
   - ☐ method limits ☐ internal limits
   - ☐ QAPP limits ☐ contract limits
   - ☐ regulatory limits ☐ blank criteria
5. ☐ Incorrect procedure(s) used. (See #10)
6. ☐ Invalid instrument calibration. (See #10)
7. ☐ Incorrect/incomplete data reported to client. (See #10)
8. ☒ Reported detection limit(s) higher than:
   - ☐ method limits ☐ QAPP limits
   - ☒ contract limits ☐ other (see #10)
   - Due to:
     - ☒ sample matrix ☒ insufficient sample
     - ☐ instrumentation ☐ other (see #10)
9. ☒ Other (specify): #04 MDAs >CL Co58, Fe59, Eu152, Eu154, Eu155 ; G-05-Fe59 #06 Fe59 + Eu154, #07 Fe59, Eu155, #09 - Co58, Fe59, Eu155 #14 Co58, Fe59, Eu155
10. ☐ Comments/Explanation:

NOTIFICATION [check appropriate item(s)]:

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

PROJECT MANAGER (signature & date): Suzy Barnes 3/16/95

FURTHER ACTION REQUIRED. SEE PAGE 2 OF 2

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QUANTERRA CORPORATION

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CORRECTIVE ACTION

☒ ROOT CAUSE: — INITIALS/DATE MK 3-10-95

#04 - insufficient sample

3-10-95 MK ~~6-05~~, 06, 07, 09, 14 - sample matrix background interference

6-05 detector efficiency of Fe59

☒ CORRECTIVE ACTION: INITIALS/DATE MK 3-10-95

data accepted MDA of ottawa sand blank is less than CL

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

FIRST LEVEL SUPERVISOR: Joel Kempema DATE: 3-10-95

RESPONSIBLE MANAGER: W Matkelle DATE: 3/16/95

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO

QC COORDINATOR: C Black DATE: 3-16-95

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON

NCM CLOSURE

QC COORDINATOR: C Black DATE: 3-16-95

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

0016

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Quanterra

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

PROJECT ID (Name/Number): BHI 1200B/43D
NCM INITIATED BY (Name/Date): Joe/TKempema 3-10-95
PARAMETER(S): Gamma
SAMPLE NUMBER(S) AFFECTED: 50151804-14, 50202001 + Associated QC
MATRIX: Soil

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

NONCONFORMANCE [check appropriate item(s)]:

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

   Due to:
   - ☐ sample matrix ☐ insufficient sample
   - ☐ instrumentation ☐ other (see #10)
9. ☒ Other (specify): Isotopes marked detected not reported 1X-Ra224 1M-Cd109, Mn54 #04 Cd109, #05 Cd109, U238DLP, #G-05 Cd109, U238DLP #06 - Cd109, Na22, Hg203 #07 - Zr95 + U238DLP ~~#08~~ JK 3-10-95
10. ☒ Comments/Explanation: #09 - Na22, Mn54, Zr95, Cd109, #12 - Cd109, U238DLP #13 - Cd109 #14 - Na22 50202001 - Cd109

NOTIFICATION [check appropriate item(s)]:

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

PROJECT MANAGER (signature & date): Suzy Lewis 3/16/95

FURTHER ACTION REQUIRED. SEE PAGE 2 OF 2

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QUANTERRA CORPORATION

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CORRECTIVE ACTION

☒ ROOT CAUSE: INITIALS/DATE TK 3-10-95

1X-Ra224DA natural constituent of following sample blank matrix
cd109 - known phantom ; Mn54 is Ac228 interference at 835.5KEV ;
U238DLP - error or 2x error > result ; Na22 is Eu154 interference @ 1274.5 KeV
Hg203 is Tl208 interference @ 277.14KEV ; Zr95 is Eu interference also
can be Th234 (Pa234M) interference

☒ CORRECTIVE ACTION: INITIALS/DATE TK 3-10-95

data accepted discuss in case narrative

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☐ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE

FIRST LEVEL SUPERVISOR: Joel Thengsma DATE: 3-10-95

RESPONSIBLE MANAGER: Ted McKellar DATE: 3/16/95

QC REVIEW

☐ NONCONFORMANCE ☒ DEFICIENCY ☐ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO

QC COORDINATOR: C Black DATE: 3/16/95

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: C Black DATE: 3-16-95

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

due 3/18/95

9613451.0882

INTERNATIONAL TECHNOLOGY CORPORATION

ITAS Data Review Checklist
RADIOCHEMISTRY

BHI

Work Order No(s): 501518, 502020 Soil

Lab Sample Numbers or SDG: WD403

Method/Test/Parameter: Alpha

	Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level review (✓)
A. 1.	**Calibration** Is the calibration documentation included where applicable?			✓	✓
B. 1.	**Sample Analysis** Are the sample Yields within acceptance criteria?			✓	✓
2.	Were all sample holding times met?	✓			✓
C. 1.	**QC Samples** Is the Blank Yield within acceptance criteria?			✓	✓
2.	Is the Minimum Detectable Activity for the Blank result ≤ the Contract Detection Limit?	✓			✓
3.	Is the Blank result ≤ the Contract Detection Limit?	✓			✓
4.	Is the Blank result greater than the Contract Detection Limit but the Sample result less than the Contract Detection Limit?			✓	✓
5.	Is the LCS result within acceptance criteria?	✓			✓
6.	Is the LCS yield within acceptance criteria?			✓	✓
7.	Is the LCS Minimum Detectable Activity less than or equal to the Contract Detection Limit?	✓			✓
8.	MS/MSD results and yield meet acceptance criteria?			✓	✓
9.	Duplicate sample results and yield meet acceptance criteria?	✓			✓
D. 1.	**Other** Are all nonconformances included and noted?	✓			✓
2.	Are all required forms filled out?	✓			✓
3.	Correct methodology used?	✓			✓
4.	Transcription checked?	✓			✓
5.	Were all calculations checked at a minimum frequency?	✓			✓
6.	Units checked?	✓			✓

Comments on any "No" response: INCM recount spikes

Analyst: Joel Kouyoumjian Date: 3-2-95

Second Level Review: Suzy Haines Date: 3/16/95

Form No: LS-038, 3/94, Rev 2

9613451.0883

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QUAN-Richland

LABORATORY NONCONFORMANCE MEMO (NCM)

PROJECT ID (Name/Number): BHI

NCM INITIATED BY (Name/Date): Joel T Kempema 3-2-95

PARAMETER(S): Alpha

SAMPLE NUMBER(S) AFFECTED: M0151815, M0151825

MATRIX: Soil

AREA: [ ] SHIP/REC [X] RADIOCHEM [ ] COUNTING [ ] BIOASSAY [ ] DATA VERIF [ ] REPORTING [ ] OTHER:

NONCONFORMANCE [check appropriate item(s)]:

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

NOTIFICATION [check appropriate item(s)]:

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

PROJECT MANAGER (signature & date): Suzy Haines 3/16/95

FURTHER ACTION REQUIRED, SEE PAGE 2 OF 2

QUANTERRA CORPORATION LOG #: RD-95- page 2 of 2

CORRECTIVE ACTION

☒ ROOT CAUSE: INITIALS/DATE JK 3-2-95

Uncertain - IS if it is an incomplete plating of liquid spike - under investigation

☒ CORRECTIVE ACTION: INITIALS/DATE JK 3-2-95

Data accepted from recount of IS - 2S spike still out of limits but 2S contains Fe carrier which may be shielding alpha. Blank & duplicate sample acceptable

☐ RESPONSIBILITY FOR PERFORMING CORRECTIVE ACTION ASSIGNED TO:

☒ ACTIONS TO PREVENT RECURRENCE: INITIALS/DATE JK 3-2-95

Continuing to investigate low spike recoveries for liquid & spikes, soil matrices.

FIRST LEVEL SUPERVISOR: Joel Kempema DATE: 3-2-95

RESPONSIBLE MANAGER: W Mackillop DATE: 3/16/95

QC REVIEW

☐ NONCONFORMANCE ☐ DEFICIENCY ☒ RERUN

☐ FURTHER ACTION REQUIRED:

ASSIGNED TO:

QC COORDINATOR: C Black DATE: 3-16-95

CORRECTIVE ACTION VERIFICATION

☒ VERIFIED ☐ CANNOT VERIFY (specify reason)

REASON:

NCM CLOSURE

QC COORDINATOR: C Black DATE: 3-16-95

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

3/18/95

9613451.0885

CB

INTERNATIONAL TECHNOLOGY CORPORATION

ITAS Data Review Checklist
RADIOCHEMISTRY

Work Order No(s): 501518 502020

Lab Sample Numbers or SDG: W0403

Method/Test/Parameter: Beta

Review Item	Yes (✓)	No (✓)	N/A (✓)	2nd Level review (✓)
A. Calibration 1. Is the calibration documentation included where applicable?			✓	
B. Sample Analysis 1. Are the sample Yields within acceptance criteria?			✓	
2. Were all sample holding times met?	✓			
C. QC Samples 1. Is the Blank Yield within acceptance criteria?			✓	
2. Is the Minimum Detectable Activity for the Blank result ≤ the Contract Detection Limit?	✓			
3. Is the Blank result ≤ the Contract Detection Limit?	✓			
4. Is the Blank result greater than the Contract Detection Limit but the Sample result less than the Contract Detection Limit?			✓	
5. Is the LCS result within acceptance criteria?	✓			
6. Is the LCS yield within acceptance criteria?			✓	
7. Is the LCS Minimum Detectable Activity less than or equal to the Contract Detection Limit?	✓			
8. MS/MSD results and yield meet acceptance criteria?			✓	
9. Duplicate sample results and yield meet acceptance criteria?	✓			
D. Other 1. Are all nonconformances included and noted?			✓	
2. Are all required forms filled out?	✓			
3. Correct methodology used?	✓			
4. Transcription checked?	✓			
5. Were all calculations checked at a minimum frequency?	✓			
6. Units checked?	✓			

Comments on any "No" response:

Analyst: Joel T Kongsma Date: 3-2-95

Second Level Review: Date:

Form No: LS-038, 3/94, Rev 2

0022

1/27/95 DAS

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 13

Date Turnaround: [ ] Priorty [X] Normal

Collector: WS Thompson/Amy Simpson, Dave St. John/Doug Bauer	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: Er-80	Field Logbook No.	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4		COOL 4					
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	P/G	P/G	P/G		
No. of Container(s)	1	1	1	1	1	1	1	1	WSt 1-27-95 1	1	1	3	2		
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml*	500ml*	950ml		
SAMPLE ANALYSIS	ICP METALS-TAL/AA MATALS (As,Pb, Se,Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F, Cl,SO4, PO4, NO2, NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA 501518	ACTIVITY SCAN	total alpha beta GEA	total alpha beta GEA	total alpha beta GEA		

1-27-95 WSt 501517

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	501518	D					
~~BOD173~~ BODMT9	17 S	1-27-95	0910	X						X	X		X					
BODMT4	12 S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X			12	
BODMR4	13 S	1-27-95	0930	X	X	X	X	X	X	X	X	WSt 1-27-95	X		X		13	
BODMR5	14 S	1-27-95	1055	X	X	X	X	X	X	X	X	X	X		X		14	
BODMX5	15 S	1-27-95	1120	X	X	X	X	X	X	X	X	X	WSt 1-27-95		X		15	
BODMS3	16 S	1-27-95	1345	X	X	X	X	X	X	X	X		X			X	16	

CHAIN OF POSSESSION	Sign/Print Names	Date/Time		Date/Time
Relinquished By	David St. John ERC	1/30/95 0830	Received By	ERC Bakthen 0870 1-30-95
Relinquished By	ERC Bakthen	1-30-95 10:40	Received By	Quanterra Karen Rettenberg 1-30-95 10:40
Relinquished By		Date/Time	Received By	Date/Time
Relinquished By		Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

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

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

Correction from 1,500ml to 3,500ml jars. wrong but initially checked, corrected in field. Wendy S Thompson 1-27-95

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

SDG W0403

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

0024

SAMPLE STATUS REPORT FOR N 4327. RAD SCREEN BODMT4 TIME: 1/30/95 7:45
DISPATCHED: 1/10/95 10:29 SAMPLE HAS NOT BEEN SLURPED
RECEIVED: 1/28/95 22:40

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

END OF REPORT

9613451.0888

INTERNATIONAL TECHNOLOGY CORPORATION

Regional Office
2800 George Washington Way
Richland, Washington 99352

SAMPLE CHECK-IN LIST

(1 Per Shipping Container)

Date/Time Received 1-30-95 10:40 Client Name BHI

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

Cooler ID (if noted on the outside of cooler) ER-80

1. Condition of shipping container? O.K.
2. Custody Seals on cooler intact? Yes ☒ No ☐
3. Custody Seals dated and signed? Yes ☒ No ☐
4. Chain of Custody record is taped on inside of cooler lid? Yes ☐ No ☒
5. Vermiculite/packing material is: Wet ☐ Dry ☒
6. Each sample is in a plastic bag? Yes ☒ No ☐
7. Number of sample containers in cooler: 62
8. Samples have: X tape ____ hazard labels
   X custody seals ____ appropriate sample labels
9. Samples are: X in good condition ____ leaking
   ____ broken ____ have air bubbles
   ____ other
10. Coolant present? Yes ☒ No ☐

Sample temperature 4°C

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

Printed Name/Signature Karen Attebury Date/Time 1-30-95 10:40

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

SCREENING CALCULATION SPREADSHEET

(R3) 1-30-95

Customer Code	Recieved Date		Screening Prep Date		Count Date	Mnts. Cntd	BACKGROUND Alpha	Beta	Mnts
WHC	1-30-95			1-30-95	1-30	10	29	227	240

Customer ID	Sample Matrix	Residue Wght	Vol. Anal.		Sample Size		SMPLE CNT DATA Hldr	Total	Counts	Net Sample Counts/Minute		DPM / Aliquot		uCi per Sample		pCi / Gm or L		1-sigma error pCi/ Gm or L		Category 1	Aliquot to Cat 1 Gm or L		
WHC	Solid/Liquid	mg	mg	ml	Gm	L	Num.	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Alpha	Beta	Yes/No	Alpha	Beta	
11 B0DMT9	SOLID	93.6	93.6		172.9		30	6	23	0.52	1.35	3.78E+00	3.04E+00	3.1E-03	2.5E-03	1.9E+01	1.5E+01	11.56	5.74	Yes	5.5E+02	6.8E+03	Cat I
12 B0DMT4	SOLID	97.5	97.5		1178.3		31	3	32	0.22	2.25	1.55E+00	5.54E+00	8.5E-03	3.0E-02	7.2E+00	2.6E+01	9.99	8.64	Yes	1.4E+03	3.9E+03	
13 B0DMR4	SOLID	94.3	94.3		595.8		32	1	21	0.02	1.15	7.75E-02	2.89E+00	2.2E-04	8.2E-03	3.7E-01	1.4E+01	9.18	5.63	Yes	2.7E+04	7.2E+03	
14 B0DMR5	SOLID	91.8	91.8		266.0		33	7	59	0.62	4.95	4.34E+00	1.20E+01	6.1E-03	1.7E-02	2.1E+01	5.9E+01	12.03	9.36	Yes	4.7E+02	1.7E+03	
15 B0DMX5	SOLID	88.3	88.3		641.1		34	1	20	0.02	1.05	7.60E-02	2.61E+00	2.6E-04	8.5E-03	4.0E-01	1.3E+01	9.45	5.82	Yes	2.5E+04	7.5E+03	
16 B0DMS3	SOLID	89.6	89.6		1083.9		35	1	21	0.02	1.15	7.48E-02	2.87E+00	4.1E-04	1.6E-02	3.6E-01	1.4E+01	9.36	5.68	Yes	2.7E+04	6.9E+03	
07 B0DMT1	SOLID	65.6	65.6		641.7		36	7	40	0.62	3.05	3.74E+00	6.91E+00	1.6E-02	3.0E-02	2.6E+01	4.7E+01	14.36	10.30	No	3.9E+02	2.1E+03	Cat II
08 B0DMS8	SOLID	96.8	96.8		1390.7		37	0	31	-0.06	2.15	-7.2E-01	5.50E+00	0.0E+00	3.6E-02	-3.3E+00	2.6E+01	8.46	6.66	Yes	-3.0E+03	3.9E+03	Cat I
09 B0DMT7	SOLID	73.9	73.9		671.8		38	269	449	26.82	43.95	1.75E+02	6.87E+01	7.2E-01	3.6E-01	1.1E+03	5.4E+02	56.66	26.60	No	9.4E+00	1.9E+02	Cat III

501517- Chem

501518- Rad

SDG- W0403

96135196

0027

9613451.0890

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-895-013
Record of Disposition No.

DATE: 01/31/95 | **LABORATORY:** Quanterra

PROJECT TITLE/NO.: 100-D Ponds/224-088 | **NCR NO.:** N/A

SAMPLE IDENTIFICATION NUMBERS:

W0389 ~~W0390~~ 50132203+05 32303+05

1) BODMT2, BODMT3 (1 SDG, standalone deliverable); BODMT6, BODMS9, BODMR2, BODMR3, BODMT5 (1 SDG, summary deliverable) W0386

W0430 ~~W0403~~ 50151712 + 51812

2) BODMT4 (1 SDG, standalone deliverable); BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMV0, BODMV1, BODMV2 (1 SDG, summary deliverable) W0403

DESCRIPTION OF EVENT:

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

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

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

DISPOSITION OF SAMPLES:

1) Results for samples BODMT2 and BODMT3 should be reported in one standalone data package. Results for samples BODMT6, BODMS9, BODMR2, BODMR3, and BODMT5 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

2) Results from sample BODMT4 should be reported in one standalone data package. Results from samples BODMR4, BODMR9, BODMS6, BODMT1, BODMR5, BODMS0, BODMS7, BODMR6, BODMS3, BODMS8, BODMT7, BODMR7, BODMS4, BODMT0, BODMT9, BOSMX5, BODMV0, BODMV1, and BODMV2 should be reported in one summary data package. Results from common QC run with the batch should be duplicated and reported in both data packages.

APPROVAL SIGNATURES:

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

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

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

Vicki

0028

9613451.0891

Quanterra

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS Gamma MATRIX Soil DUE DATE 3-18-95

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
M	-1B	BHI	QC BATCH REAGENT BLANK
M01518	-1X		QC BATCH MATRIX BLANK OSBK
M01518	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE CAL 491
M	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
G01518	-05		Duplicate of Sample # 50151805
50151807 ~~54~~ R24495	-14		
50202001	-N/A		
	-		
	-		
	-		
	-		
	-		
	-	2-14-95	
	-		
	-		
	-		
	-		

Batched and QC updated by M on 2-14-95 Rec'd in C.R. by Tlw on 2-14-95

Rec'd in Prep Lab by M on 2-3-95 Data Reviewed and anal. Prep stored MK on 3-10-95

Rec'd in Sep Lab by N/A on N/A

Rec'd in Sep lab by N/A on N/A Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/95, Rev. 5

9613451.0892 *** GAMMA ***

894-098 CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

30-Jan-1995
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W0403

MATRIX : SOIL

BATCH NUMBER 01-518

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	M015181X ✓				OSBK
	M0151815M ✓				CAL 491
1)	~~50151801~~		~~BHI~~	~~BODMS4~~ ~~2-8-95~~	
2)	~~50151802~~		~~BHI~~	~~BODMR9~~ ~~2-8-95~~	
3)	~~50151803~~		~~BHI~~	~~BODMT0~~ ~~2-8-95~~	
4)	50151804 ✓		BHI	BODMR6	
5)	50151805 ✓		BHI	BODMR7	
	60151805 ✓				Duplicate
6)	50151806 ✓		BHI	BODMS6	
7)	50151807 ✓		BHI	BODMT1	
8)	~~50151808~~		~~BHI~~	~~BODMS8~~ ~~2-8-95~~	
9)	50151809 ✓		BHI	BODMT7	
10)	~~50151810~~		~~BHI~~	~~BODMS0~~ ~~2-8-95~~	
11)	~~50151811~~		~~BHI~~	~~BODMS7~~ ~~2-8-95~~	
12)	50151812		BHI	BODMT4	
13)	50151813		BHI	BODMR4	
14)	50151814		BHI	BODMR5	
15)	~~50151815~~		~~BHI~~	~~BODMX5~~ ~~2-8-95~~	

ACTIONS (Initial & Date)

1) INITIATED 1/30/95

2) PREP LAB RECEIVED 1-31-95

3) SAMPLE REMAINDER STORED 2-14-95

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

9613451.0893

Quanterra

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS ALPHA MATRIX SOIL DUE DATE 3-18-95

WD403

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
M 01518	-1B	BHI	QC BATCH REAGENT BLANK
M	-1X		QC BATCH MATRIX BLANK
M 01518	-1M or (1S) (circle) 10.009 ± .0906 DPMC		QC BATCH MATRIX/REAGENT SPIKE EQEG 670
M 01518	-2M or (2S) (circle) 9.9847 ± .0902 DPMC		QC BATCH MATRIX/REAGENT SPIKE EQEG 665
G 01518	-04		Duplicate of Sample # 50151804
50151804	-14		
50202001	-N/A		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		
	-		

2-24-95

Batched and QC updated by FS on 2-24-95 Rec'd in C.R. by SK on 2-24-95

Rec'd in Prep Lab by FS on 2-3-95 Data Reviewed and anal. Prep stored JR on 3-2-95

Rec'd in Sep Lab by N/A on N/A

Rec'd in Sep lab by N/A on N/A Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/95, Rev. 5

3-18-95

9613451.0894 *** ALPHA ***

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

30-Jan-1995
Page 1

894-098

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W0403

MATRIX : SOIL

BATCH NUMBER 01-518

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	M0151818 M0151815 M0151825				EQE6 670 EQE6 665
1)	~~50151801~~		~~BHI~~	~~BODMS4~~ 2-8-95	
2)	~~50151802~~		~~BHI~~	~~BODMR7~~ 2-8-95	
3)	~~50151803~~		~~BHI~~	~~BODMT0~~ 2-8-95	
4)	50151804		BHI	BODMR6	
	G0151804				Duplicate
5)	50151805		BHI	BODMR7	
6)	50151806		BHI	BODMS6	
7)	50151807		BHI	BODMT1	
8)	~~50151808~~		~~BHI~~	~~BODMS8~~ 2-8-95	
9)	50151809		BHI	BODMT7	
10)	~~50151810~~		~~BHI~~	~~BODMS0~~ 2-8-95	
11)	~~50151811~~		~~BHI~~	~~BODMS7~~ 2-8-95	
12)	50151812		BHI	BODMT4	
13)	50151813		BHI	BODMR4	
14)	50151814		BHI	BODMR5	
15)	~~50151815~~		~~BHI~~	~~BODMX5~~ 2-8-95	

ACTIONS (Initial & Date)

1) INITIATED (S) 1/30/95

2) PREP LAB RECEIVED 1-31-95 S

3) SAMPLE REMAINDER STORED 2-24-95 S

4) SEPARATION LAB RECEIVED n/a

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

9613451.0895

INTERNATIONAL TECHNOLOGY CORPORATION

DUE DATE 3/8/95

REANALYSIS / RECOUNT

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

ANALYSIS Alpha

CUSTOMER BHI

MATRIX Soil

NAME/DATE JRK, 2-28-95

SAMPLE DELIVERY GROUP W0403/438

BATCH NUMBER

ITAS ID	CUSTOMER ID	COMMENTS
1) M0151815	EQEG670 10.09 ± .090592 0PM	67% recovery
2) M0151828	EQEG665 9.9847 ± .090377 0PM	No recovery
3)		
4)		
5)		
6)		
7)		
8)		
9)		
10)		

JRK 2-28-95

REANALYSIS

REFERENCED QC

ITAS ID - BLANK

ITAS ID - SPIKE

CLIENT CODE

ACTIONS (Initial & Date)

PREP LAB RECEIVED

SAMPLE REMAINDER RETURNED TO SCG ☐ (CHECK ONE)

NO SAMPLE REMAINING ☐

SEPARATION LAB

COUNTING/MEASUREMENT

DATA REVIEWED

ANALYTICAL PREP STORED

RECOUNT

ACTIONS (Initial & Date)

COUNTING/MEASUREMENT AB 2/28/9

DATA REVIEWED JRK 3-2-95

ANALYTICAL PREP STORED

ADDITIONAL COMMENTS:

Spike 72% - accepted

RC-048 12/92 REV

0033

9613451.0896

Quanterra

BATCH SUMMARY/CHAIN OF CUSTODY

ANALYSIS Beta MATRIX Soil DUE DATE 3-18-95

W0403

WORK ORDER	SEQUENCE #	CLIENT	COMMENTS
M01518	-1B	BHI	QC BATCH REAGENT BLANK
M	-1X		QC BATCH MATRIX BLANK
M01518	-1M or 1S (circle)		QC BATCH MATRIX/REAGENT SPIKE EQAU 223
M	-2M or 2S (circle)		QC BATCH MATRIX/REAGENT SPIKE
G01518	-04		Duplicate of Sample # 50151804
50151804	-14		
50202001	-N/A		
	-		
	-		
	-		
	-		
	-		
	-		2-24-95
	-		
	-		
	-		
	-		

Batched and QC updated by F on 2-24-95 Rec'd in C.R. by SK on 2-24-95

Rec'd in Prep Lab by F on 2-3-95 Data Reviewed and anal. Prep stored ATC on 2-28-95

Rec'd in Sep Lab by N/A on N/A

Rec'd in Sep lab by N/A on N/A Samples Disposed by _____ on _____

Original batch sheet and complete calculation file to be filed with the FIRST listed work order number.

FORM NO.: RC-52, 1/95, Rev. 5

3-18-95

9613451.0897 *** BETA ***

894-098

CHAIN-OF-CUSTODY BATCH ANALYSIS RECORD

30-Jan-1995
Page 1

CUSTOMER: BHI

SAMPLE DELIVERY GROUP W0403

MATRIX : SOIL

BATCH NUMBER 01-518

	ITAS ID	DUP	ACCOUNT	CUSTOMER ID	COMMENTS
	M01~~58~~1B 2-24-95		518B		
	M01~~58~~1S 2-24-95		518S		EQAU 223 29.963± 1.2277 DF
1)	~~50151801~~		~~BHI~~	~~BODMS4~~ 2-8-95	
2)	~~50151802~~		~~BHI~~	~~BODMR9~~ 2-8-95	
3)	~~50151803~~		~~BHI~~	~~BODMT0~~ 2-8-95	
4)	50151804		BHI	BODMR6	
	50151804				Duplicate
5)	50151805		BHI	BODMR7	
6)	50151806		BHI	BODMS6	
7)	50151807		BHI	BODMT1	
8)	~~50151808~~		~~BHI~~	~~BODMS8~~ 2-8-95	
9)	50151809		BHI	BODMT7	
10)	~~50151810~~		~~BHI~~	~~BODMS0~~ 2-8-95	
11)	~~50151811~~		~~BHI~~	~~BODMS7~~ 2-8-95	
12)	50151812		BHI	BODMT4	
13)	50151813		BHI	BODMR4	
14)	50151814		BHI	BODMR5	
15)	~~50151815~~		~~BHI~~	~~BODMX5~~ 2-8-95	

ACTIONS (Initial & Date)

1) INITIATED 1/30/95

2) PREP LAB RECEIVED 1-31-95

3) SAMPLE REMAINDER STORED 2-24-95

4) SEPARATION LAB RECEIVED N/A

5) COUNTING/MEASUREMENT LAB

6) DATA REVIEWED AND ANALYTICAL PREP STORED

9613451.0898

INTERNATIONAL TECHNOLOGY CORPORATION

Q.C. VIAL TRANSMITTAL RECORD

PURPOSE: Issuance of:

Spikes	Am 241 (10 dpm)
Yield Monitor(s)	
Quench Monitor(s)	
Carrier(s)	Fe Carrier (5 mg)
Internal Audit Sample(s)	
Sealed Source(s)	
Other	

If "Other," explain:

Am241 83A343 #3230
Fe Carrier 10 mg/ml
RD 3302 1/18/94

DESCRIPTION OF ITEM:

ITAS #	Vial Code #	Quantity	Matrix
	EQEG 661 thru	5	
	EQEG665		

Prepared By: [signature]

Date Prepared: 2/3/95

Reviewed By: [signature]

Date Reviewed: 2-10-95

Form: CC-002, 11/90, Rev 1

9613451.0899

SPIKE PREPARATION RECORD

Prepared By: RH Preparation Date: 03FEB95 Reference date 17JUL94

Source Identification: AM24183A343 Isotope: AM-241

Source Activity (dpm +- dpm per wt/vol unit): 1.4990E+01 +- 1.3568E-01

VIAL ID	WT/VOL	ACTIVITY*	TOTAL ERROR	Fe Carrier wt/vol
EQEG661	0.6668 G	9.9952E+00	9.0472E-02	.5040 g
EQEG662	0.6670 G	9.9982E+00	9.0499E-02	.5030 g
EQEG663	0.6670 G	9.9982E+00	9.0499E-02	.5039 g
EQEG664	0.6668 G	9.9952E+00	9.0472E-02	.5050 g
EQEG665	0.6661 G	9.9847E+00	9.0377E-02	.4987 g

* Activity decay corrected to Preparation Date, 12:00, except SR-85

9613451.0900

INTERNATIONAL TECHNOLOGY CORPORATION

Q.C. VIAL TRANSMITTAL RECORD

PURPOSE: Issuance of:

Spikes	Am 241 (10dpm)
Yield Monitor(s)	
Quench Monitor(s)	
Carrier(s)	
Internal Audit Sample(s)	
Sealed Source(s)	
Other	

If "Other," explain:

Am 241 83A343 #3230

DESCRIPTION OF ITEM:

ITAS #	Vial Code #	Quantity	Matrix
	EQ EG 666 thru	5	
	EQ EG 670		

Prepared By: [illegible] Reviewed By: AKB

Date Prepared: 2/6/95 Date Reviewed: 2-10-95

Form: CC-002, 11/90, Rev 1

9613451.0901

SPIKE PREPARATION RECORD

Prepared By: RH Preparation Date: 06FEB95 Reference date 17JUL94

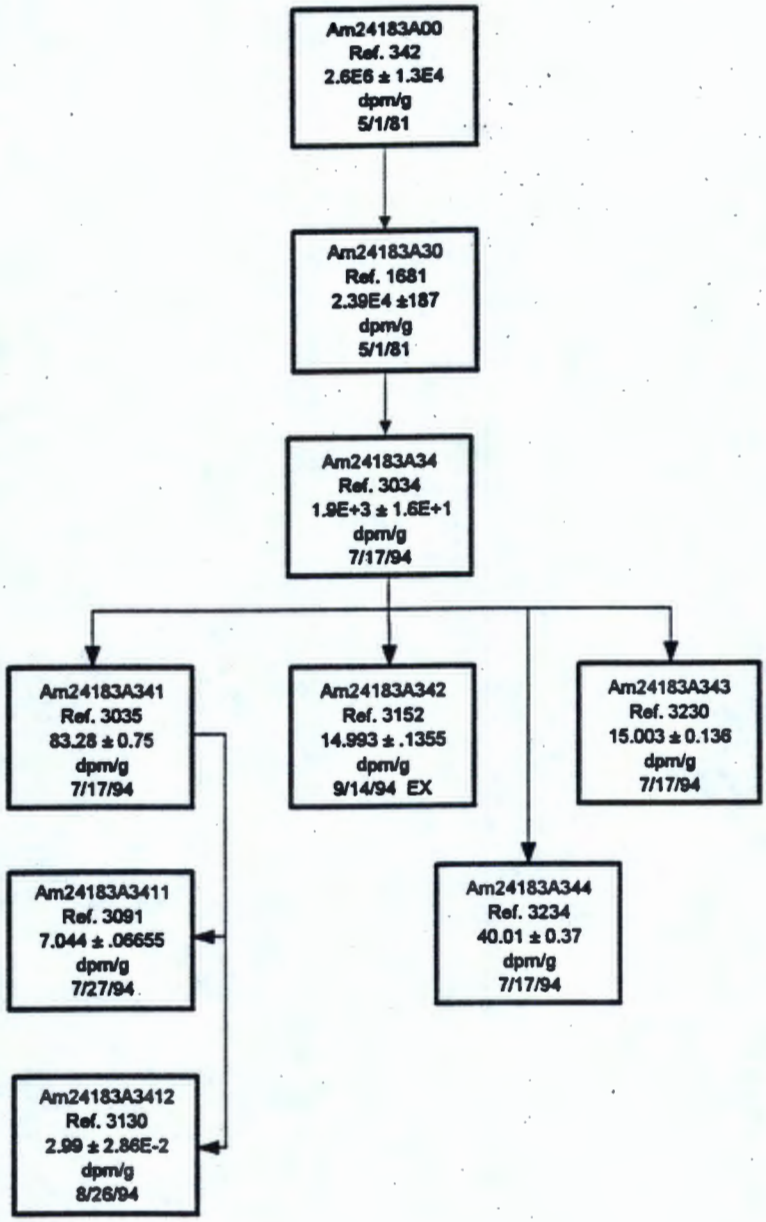
Source Identification: AM24183A343 Isotope: AM-241

Source Activity (dpm +- dpm per wt/vol unit): 1.4990E+01 +- 1.3568E-01

VIAL ID	WT/VOL	ACTIVITY*	TOTAL ERROR
EQEG666	0.6681 G	1.0015E+01	9.0647E-02
EQEG667	0.6662 G	9.9860E+00	9.0389E-02
EQEG668	0.6685 G	1.0021E+01	9.0701E-02
EQEG669	0.6677 G	1.0009E+01	9.0592E-02
EQEG670	0.6677 G	1.0009E+01	9.0592E-02

* Activity decay corrected to Preparation Date, 12:00, except SR-85

AM24183A34


Am24183A00
Ref. 342
2.6E6 ± 1.3E4
dpm/g
5/1/81
Am24183A30
Ref. 1681
2.39E4 ±187
dpm/g
5/1/81
Am24183A34
Ref. 3034
1.9E+3 ± 1.6E+1
dpm/g
7/17/94
Am24183A341
Ref. 3035
83.28 ± 0.75
dpm/g
7/17/94
Am24183A342
Ref. 3152
14.993 ± .1355
dpm/g
9/14/94 EX
Am24183A343
Ref. 3230
15.003 ± 0.136
dpm/g
7/17/94
Am24183A3411
Ref. 3091
7.044 ± .06655
dpm/g
7/27/94
Am24183A344
Ref. 3234
40.01 ± 0.37
dpm/g
7/17/94
Am24183A3412
Ref. 3130
2.99 ± 2.86E-2
dpm/g
8/26/94

AM241A34.XLW

ISOTOPE DILUTION RECORD

1) Prepared by R.H.		2) Date Prepared	12/6/94
3) Source Identification Number / Ref. Number	***Am24183A34***		***3034***
4) Source Activity (dpm ± dpm/g)	1.8747E+03	±	1.574E+01
5) Percent error of Source Activity	0.84 %		
6) Weight of Source Material used (g)	1.5916		
7) (% Error) of Weight of Source Material used	0.0910 %		
8) Diluent	2M HNO3		
9) Total Weight of the Dilution (g)	198.88		
10) (% Error) of Total Weight of the Dilution	0.0228 %		
11) Specific Activity of Diluted Solution dpm/g	***1.5003E+01***	±	***1.358E-01***
12) Total Uncertainty	0.905 %		
13) Dilution Identification Number / Ref. Number	***Am24183A343***		***3230***
14) Calibration Reference Date	7/17/94		
15) Isotope Inventory File update by/date	D.M.		12/7/94
16) Reviewed by/date	SKB		12/8/94
17) Location I-08		18) Exhausted	

****

CALCULATIONS

*7) % Error of Wt. used = (0.0048 / Weight of Source Material used * 100) ^2*

*10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100) ^2*

*11) Specific Activity = Source Activity * Wt. of Source Material used / Total Wt. of the Dilution*

12) % Total Uncertainty = √(% error of Source Activity ^2 + % error of Wt. used + % error of Dilution Wt.)

Form: CC-006, 5/5/94, Rev 2

0150

AM241A34.XLW

ISOTOPE DILUTION RECORD

1) Prepared by	W.G.	2) Date Prepared	7/17/94
3) Source Identification Number / Ref. Number	**AM24183A30**		**1681**
4) Source Activity (dpm ± dpm/g)	2.3394E+04	±	1.832E+02
5) Percent error of Source Activity	0.782 %		
6) Weight of Source Material used (g)	8.0281		
7) (% Error) of Weight of Source Material used	0.0036 %		
8) Diluent	2M HNO3		
9) Total Weight of the Dilution (g)	100.18		
10) (% Error) of Total Weight of the Dilution	0.0897 %		
11) Specific Activity of Diluted Solution dpm/g	**1.8747E+03**	±	**1.574E+01**
12) Total Uncertainty	0.840 %		
13) Dilution Identification Number / Ref. Number	**AM24183A34**		**3034**
14) Calibration Reference Date	7/17/94		
15) Isotope Inventory File update by/date	W.G.		7/17/94
16) Reviewed by/date	D.M.		7/20/94
17) Location	0-3	18) Exhausted	

CALCULATIONS

*7) % Error of Wt. used = (0.0048 / Weight of Source Material used * 100) ^2*

*10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100) ^2*

*11) Specific Activity = Source Activity * Wt. of Source Material used / Total Wt. of the Dilution*

12) % Total Uncertainty = √(% error of Source Activity ^2 + % error of Wt. used + % error of Dilution Wt.)

Form: CC-006, 5/5/94, Rev 2

ISOTOPE DILUTION RECORD

1) Prepared by	D.S.	2) Date Prepared	10/12/89
3) Source Identification Number / Ref. Number	***Am24183A00***		***342***
4) Source Activity (dpm ± dpm/g) (% error)	2.6220E+06	±	1.310E+04
5) Percent error of Source Activity	0.5 %		
6) Weight of Source Material used (g)	0.9188		
7) (% Error) of Weight of Source Material used	0.2729 %		
8) Diluent	2M HNO3		
9) Total Weight of the Dilution (g)	100.82		
10) (% Error) of Total Weight of the Dilution	0.0885 %		
11) Specific Activity of Diluted Solution dpm/g	***2.3895E+04***	±	***1.868E+02***
12) Total Uncertainty	0.782 %		
13) Dilution Identification Number / Ref. Number	***Am24183A30***		***1681***
14) Calibration Reference Date	5/1/81		
15) Isotope Inventory File update by/date	D.S.		10/12/89
16) Reviewed by/date	D.S.		5/20/94
17) Location	std lab	18) Exhausted	

****

CALCULATIONS

*7) % Error of Wt. used = (0.0048 / Weight of Source Material used * 100) ^2*

*10) % error of Dilution Wt. = (0.3 / Total Weight of Dilution * 100) ^2*

*11) Specific Activity = Source Activity * Wt. of Source Material used / Total Wt. of the Dilution*

12) % Total Uncertainty = $\sqrt{\text{(\% error of Source Activity ^2 + \% error of Wt. used + \% error of Dilution Wt.)}}$

Form: CC-006, 5/5/94, Rev 2

INTERNATIONAL TECHNOLOGY CORPORATION 9613451.0906

ISOTOPE RECORD FORM

1) Isotope Am-241 2) ITAS Sequence Number 342

3) Half Life 433 yrs 4) Storage Location P G-1

5) Source Identification Number Am 24183 AØØØ

****

CALIBRATION DATA

6) Activity as Received Units 43.7 KBq/g

7) Overall Uncertainty .5%

8) Reference Date/Time 01-MAY-81 1200 GMT

9) Activity dpm/g ~~2.00~~ DS 10/27/93 2.622×10^6

10) Volume and/or Mass (ml (g) 5.1359 11) Calibrated by AmeR

12) Certificate Solution Number S1/19/23 P 18126

****

SURVEY DATA

13) Date Received 20JAN83

14) Survey Reading (Beta/Gamma) > 3000 c/m vial surface

15) Survey Reading (Alpha) Ø 16) Surveyed by DS

17) Isotope File Updated by DS

****

18) Activity Conversion

43.7 KBq/g x 1000 Bq/KBq x 60 dpm/Bq = 2.622×10^6 dpm

19) Remarks $\pm 1.31 \times 10^4$

20) CC Approved DS 10/28/93

FORM CC-008, 01/10/91, Rev 1

342

[redacted]

Description	Principal radionuclide: Americium-241	Product code:	AMZ.440
		Solution number:	S1/19/23

Measurement

Reference time:	1200 GMT on 1 May 1981	
Radioactive concentration of americium-241:	1.181	microcuries per gram of solution
which is equivalent to:	43.7	kilobecquerels per gram of solution
Mass of solution:	5.1359	grams
Total activity of americium-241:	6.07	microcuries
which is equivalent to:	224	kilobecquerels

Method of measurement used (see reverse of certificate): F

Accuracy

Overall uncertainty in the radioactive concentration quoted above: ± 0.5 %

Random uncertainty: ± 0.2 % Systematic uncertainty: ± 0.3 %

Overall uncertainty is defined on the reverse of the certificate.

Radionuclidic Purity

The estimated activities of any radioactive impurities found by high resolution gamma ray spectrometry, or in any other examination of the solution, are listed below expressed as percentages of the activity of the principal radionuclide at the reference time:

Pu-238 less than 0.004 %

Chemical Composition

0.5M nitric acid. The solution is carrier free.

Physical Data

Recommended half-life: 433 ± 4 years

100% alpha particle emission followed in 35.3% of disintegrations by prompt gamma photons with an energy of 0.0595 MeV.

Remarks

The result of this standardization is independent of the number of 0.0595 MeV photons assumed to be emitted.

Approved

Grant

A Ainsworth

0154

4/26/95

Data Validation Check List

for Project 100-D-PONDS II

HEIS Samp Number	Client Sample Number	Master DP File Number	DP Sequence Number	Laboratory	Y/N	VOA	Y/N	SEMI VOA	Y/N	PEST/PCB	Y/N	WETCHEM	Y/N	METALS	COMMENTS	Y/N	RADCHEM	Date OSM Rcvd DP
BODMT4		W0430		QUANTERRA	Y	3/16/95	Y	3/16/95	Y	3/16/95	Y	3/16/95	Y	3/16/95	01/30/95 - SAF-B94-098	Y	3/16/95	3/16/95

Data Entry Complete: DP DSA 4-26-95

DATATRAC 4/26/95

9613451 0008

Validation Rcvd 4-21-95

9613451.0909

DON'T SAY IT - - WRITE IT!

Date:

From: P. K. Reich H4-14, (509) 372-2785

Subject: Correction of Validation Date Received Stamp

The Date Stamped on this Validation Report is the date the final correction documents were received in the completion of the Validation Review Process.

The original front page(s) are maintained as a documented record of the date the Validation Report was originally received from the Validators.

Thank You,

Pat Reich
Data Management

9613451.0910
RECORD COPY

APR 1995
RECEIVED
Validation
Log In

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Inorganics - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-QES prepared by Quanterra Environmental Services (QTES). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
B0DMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: CLP-ICP Metals/AA Metals

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

  Holding time requirements for all analytes were met.

9613451.0911
RECORD COPY

APR 1995
RECEIVED
Validation
Log In

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Wet Chemistry - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-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
B0DMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: Fluoride, Sulfate, Chloride, Sulfide, Nitrate, Nitrite, Phosphate, Nitrate/Nitrite and TOX

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

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

Holding times for all analytes met QC requirements.

- **Blanks**

One laboratory preparation blank is analyzed with each sample batch. At least one initial calibration blank is analyzed for every 20 samples. As per WHC guidelines, no qualification of data was necessary.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must fall within a range of 75% to 125%. Samples with a spike recovery <30% and a sample value below the IDL are rejected and flagged "UR". Samples with a spike recovery between 30% to 74% and a sample value below the IDL are qualified as estimates and flagged "UJ". Samples with a spike recovery of <75% or >125% and a sample value >IDL are qualified as "J". Finally, samples with a spike recovery of >125% and a sample value <IDL are acceptable and do not require qualification.

All matrix spike results were acceptable.

Laboratory Control Sample Recovery

The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be prepared (e.g., digested or distilled) and analyzed with every group of samples which have been prepared together. The performance criteria for aqueous LCS percent recovery is 80% to 120%. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

All LCS results were acceptable.

- **Precision**

  Laboratory duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Samples whose precision results fell outside the quality control limits were qualified as estimates and flagged "J".

  All duplicate analyses results were acceptable.

- **Sample Result Verification and Detection Limits**

  Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. The reviewer verified that the results and detection limits fell within the linear range of the instrument.

  All sample results and reported detection limits were acceptable.

- **Completeness**

  Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion rate was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

None found.

REFERENCES

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

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

EPA, 1988d, *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1990, *EPA Contract Laboratory Program Statement of Work for Inorganic Analyses, Multi-media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

9613451.0915

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

9613451.0917

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W0430	REVIEWER: RJS	DATE: 4/10/95	PAGE 1 OF 1
COMMENTS: No qualification required			
COMPOUND	QUALIFIERS	SAMPLES AFFECTED	REASON

9613451.0919

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

WET CHEMISTRY/ANIONS ANALYSIS, WATER MATRIX, (mg/L)

Project: WESTINGHOUSE-HANFORD																							
Laboratory: QUANTERRA																							
Case	SDG: W0430																						
Sample Number		B0DMT4																					
Location		Test Pit #2																					
Remarks	UG/G	Soil																					
Sample Date		01/27/95																					
Wet Chemistry Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Fluoride	300.0	0.96	U																				
Sulfate	300.0	54.1																					
Chloride	300.0	2.40	U																				
Sulfide	9030	11.8																					
Nitrate	300.0	1.03																					
Nitrite	300.0	0.19	U																				
Phosphate	300.0	9.60	U																				
Nitrate/Nitrite	353.1	1.00																					
TOX	9020	49.3	U																				

RJS 5/9/95

EB = Equipment Blank

9615345.0020

000020

9613451.0921

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

Project: 550.56

tegory: Nitrate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

ent D	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
MS4	7444-001	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	5.42	UG/G		0.21	1
MS4	7444-001DUP	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	5.34	UG/G		0.21	1
MS4	7444-001MS	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	93	%REC			1
MT4	7444-008	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	1.03	UG/G		0.19	1
	QCBLK58660-1	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	0.20	UG/G	U	0.20	1
	QCLCS58660-1	Nitrate	14797-55-8	QCBLK58660-1	02/03/95	02/03/95	98	%REC			1

RJS
5/9/95

9613451.0922

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

Project: 550.56

tegory: Nitrite
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

ent D	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
MS4	7444-001	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.21	UG/G	U	0.21	1
MS4	7444-001DUP	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.21	UG/G	U	0.21	1
MS4	7444-001MS	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	103	%REC			5
MT4	7444-008	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.19	UG/G	U	0.19	1
	QCBLK58660-1	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	0.20	UG/G	U	0.20	1
	QCLCS58660-1	Nitrite	7632-00-0	QCBLK58660-1	02/03/95	02/03/95	98	%REC			1

RJS 5/9/95

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9613451.0923

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

Project: 550.56

ategory: Orthophosphate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

ient ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
DMS4	7444-001	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.4	UG/G	U	10.4	1
DMS4	7444-001DUP	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.3	UG/G	U	10.3	1
DMS4	7444-001MS	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	104	%REC			1
DMT4	7444-008	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	9.60	UG/G	U	9.60	1
	QCBLK58660-1	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	10.0	UG/G	U	10.0	1
	QCLCS58660-1	Ortho-Phosphate	7778-77-0	QCBLK58660-1	02/03/95	02/03/95	93	%REC			1

RJS
5/9/95

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9613451.0924

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

Project: 550.56

Category: Chloride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

lient ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
0DMS4	7444-001	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.59	UG/G	U	2.59	1
0DMS4	7444-001DUP	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.58	UG/G	U	2.58	1
0DMS4	7444-001MS	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	100	%REC			5
0DMT4	7444-008	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.40	UG/G	U	2.40	1
A	QCBLK58660-1	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	2.50	UG/G	U	2.50	1
A	QCLCS58660-1	Chloride	16887-00-6	QCBLK58660-1	02/03/95	02/03/95	90	%REC			1

RJS
4/11/95

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

Project: 550.56

:ategory: Fluoride
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

.ient ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
)DMS4	7444-001	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.04	UG/G	U	1.04	1
)DMS4	7444-001DUP	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.03	UG/G	U	1.03	1
)DMS4	7444-001MS	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	112	%REC			1
)DMT4	7444-008	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	0.96	UG/G	U	0.96	1
A	QCBLK58660-1	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	1.00	UG/G	U	1.00	1
A	QCLCS58660-1	Fluoride	16984-48-8	QCBLK58660-1	02/03/95	02/03/95	103	%REC			1

RJS 4/11/95

9613451.0926

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

Project: 550.56

Category: Sulfate
Method: EPA 300.0
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
ODMS4	7444-001	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	25.1	UG/G		10.4	1
ODMS4	7444-001DUP	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	24.7	UG/G		10.3	1
ODMS4	7444-001MS	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	95	%REC			5
ODMT4	7444-008	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	54.1	UG/G		9.60	1
A	QCBLK58660-1	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	10.0	UG/G	U	10.0	1
A	QCLCS58660-1	Sulfate	14808-79-8	QCBLK58660-1	02/03/95	02/03/95	92	%REC			1

RJD 4/11/95

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9613451.0927

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

Project: 550.56

Category: Sulfide
Method: EPA 9030
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
BODMS4	7444-001	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.1	UG/G	U	11.1	1
BODMS4	7444-001DUP	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.0	UG/G	U	11.0	1
BODMS4	7444-001MS	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	107	%REC			1
BODMT4	7444-008	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	11.8	UG/G		11.4	1
NA	QCBLK58516-1	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	10.6	UG/G	U	10.6	1
NA	QCLCS58516-1	Sulfide	18496-25-8	QCBLK58516-1	02/03/95	02/03/95	105	%REC			1

RJS 4/11/95

9613451.0928

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

Project: 550.56

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

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/07/95

lient ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
0DMS4	7444-001	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	4.73	UG/G		0.51	1
0DMS4	7444-001DUP	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	4.75	UG/G		0.51	1
0DMS4	7444-001MS	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	80	%REC			1
0DMT4	7444-008	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	1.00	UG/G		0.53	1
A	QCBLK59558-1	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	0.50	UG/G	U	0.50	1
A	QCLCS59558-1	Nitrate/Nitrite	C-005	QCBLK59558-1	02/15/95	02/15/95	107	%REC			1

RJS 4/11/95

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9613451.0929

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

Project: 550.56

Category: TOX
Method: EPA 9020
Matrix: SOLID

Sample Date : 01/27/95
Receipt Date : 01/30/95
Report Date : 03/09/95

Client ID	Quanterra ID	Analyte	CAS Number	Blank Sample Name	Prep. Date	Analyses Date	Result	Unit	Qual.	Detection Limit	Dil.
ODMS4	7444-001	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	47.7	UG/G	U	47.7	1
ODMS4	7444-001DUP	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	48.1	UG/G	U	48.1	1
ODMS4	7444-001MS	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	95	%REC			1
ODMT4	7444-008	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	49.3	UG/G	U	49.3	1
A	QCBLK58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	50.0	UG/G	U	50.0	1
A	QCLCS58657-1	EOX	IT-EOX	QCBLK58657-1	02/06/95	02/06/95	99	%REC			1

RJS 4/11/95

9613451.0930

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra
Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

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

March 7, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 30, 1995
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Standalone

I. Introduction

On January 30, 1995, one (1) soil sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7444-008	B0DMT4	50151712	Soil	01/30/95

II. Analytical Results/ Methodology

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

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

Quanterra
Environmental Services

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0403 after analysis had been done, therefore matrix QC associated with SDG W0403 is included in this SDG to meet requirements.

IV. Definitions

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

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

V. Comments

Samples that arrived in St. Louis on January 30, 1995 were received at 0°C and 1 °C which is not within the recommended 4°C ± 2°C.

Samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DV1, and B0DMV2 are reported in SDG W0403 as a summary package. Sample B0DMT4 is reported in SDG W0430 as a standalone package. See ROD-B95-013.

Sample 7444-001 is included in this package only for the purpose of verifying matrix QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the VOA or BNA analyses.

Continuing Calibrations had several compounds with %Difference greater than 15, but there are no positive hits for these compounds in the sample so the analsis is valid as is.

Matrix Spike and Matrix Spike Duplicate for antimony were outside of suggested limits of 75-125 percent on sample 7444-001.

Quanterra
Environmental Services

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 3

Matrix Spike Duplicate for thallium was outside of suggested limits of 75-125 percent on sample 7444-001.

Nitrate, nitrite, and phosphate hold times expired upon receipt.

Relative Percent Difference for fluoride, chloride, phosphate, and nitrite could not be calculated due to values being below the detection limits on sample 7444-001.

Relative Percent Difference for sulfide could not be calculated due to values being below the detection limit on sample 7444-001.

Relative Percent Difference for TOX could not be calculated due to values being below the detection limit on sample 7444-001.

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:\\sqtmlo01\price$\abbydave\hanford\hanw0430.nar

1/27/95 LAS

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 13

Data Turnaround: [ ] Priorty [X] Normal

Collector: WS Thompson/Amy Simpson; Dave St. John / Doug Bauer	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: Er-80	Field Logbook No.	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP METALS-TAL/AA MATALS (As,Pb, Se,Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F, Cl,SO4, PO4, NO2, NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN				
Preservative				COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4		COOL 4				
Type of Container				aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	P/G	P/G	P/G	
No. of Container(s)				1	1	1	1	1	1	1	1	WST 1-27-95 1	1	1	3	2	
Volume				125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml*	500ml*	950ml	
SAMPLE ANALYSIS														total alpha beta GEA	total alpha beta GEA	total alpha beta GEA	
1-27-95 WST 500-173 BODMT9	17 S	1-27-95	0910	A						B	C		D				
BODMT4 12	S	1-27-95	0930														12
BODMR4	13 S	1-27-95	0930									WST 1-27-95					13
BODMR5	14 S	1-27-95	1055														14
BODMX5	15 S	1-27-95	1120									WST 1-27-95					15
BODMS3	16 S	1-27-95	1345														16

CHAIN OF POSSESSION	Sign/Print Name	Date/Time
Relinquished By: David St. John ERC		1/30/95 0830
Received By: ERC Bakkter		0870 1-30-95
Relinquished By: ERC Bakkter		10:40 1-30-95
Received By: Quantera		10:40 1-30-95
Relinquished By		
Received By		
Relinquished By		
Received By		

SPECIAL INSTRUCTIONS

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

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

Correction from 1,500ml to 3,500ml jars. Wrong but initially checked, corrected in field. Wendy S Thompson 1-27-95

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
			SDG W0403

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9613451.0931

9613451.0935

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

DATE: 01/31/95 | **LABORATORY:** Quanterra

PROJECT TITLE/NO.: 100-D Ponds/B04-099 | **NCR NO.:** N/A

SAMPLE IDENTIFICATION NUMBERS:

W0389 ~~W0390~~ 50132209 +05 32303 +05

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable) W0386

W0430 ~~W0403~~ 50151712 + 51812

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable) W0403

DESCRIPTION OF EVENT:

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

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

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

DISPOSITION OF SAMPLES:

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

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

APPROVAL SIGNATURES:

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

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

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

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~~0028BC~~

OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

RCS 1/17/95

REV. 3 . DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY:
1. EXPEDITED RESPONSE ACTION
2. ✓ TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA ✓ RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY ✓ REGULAR ✓ RADCHEM

SAMPLE MATRIX: ✓ SOIL/SEDIMENT WATER VEGETATION OILS
SLUDGE CONCRETE OTHER _____

LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
Quanterra (Main)	Not Applicable	N/A
Lockheed (Split)	Not Applicable	N/A

COMMENTS:

▸▸ Revision 1 — Changes to the EAL bottle requirements.

▸▸ Revision 2 — Change to laboratories.

▸▸ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

▸▸ Data Deliverable — Standalone

▸▸ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

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Appendix 5

Data Validation Supporting Documentation

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: WHC/BHI			DATA PACKAGE: W0430-QES		
VALIDATOR: RJS		LAB: Quanterra		DATE: 3/31/95	
CASE: 100-DR-1 100-D-PONDS			SDG: W0430		

ANALYSES PERFORMED

☐ Anions/IC	☐ TOC	☒ TOX	☐ TPH-418.1	Oil and Grease	Alkalinity
☐ Ammonia	☐ BOD/COD	☒ Chloride	☐ Chromium-VI	☐ pH	☒ NO_2/NO_3
☒ Sulfate	☐ TDS	☐ TKN	☒ Phosphate	☐	☒ Nitrate
☒ fluoride	☒ Sulfide	☐	☐	☐	☒ Nitrite

SAMPLES/MATRIX

BODMT4 (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

RBC for RJS

Comments:

Chloride - 28 days ✓

fluoride - 28 days ✓

Nitrate - 2 days ~~(7 days) >2x Limit (UR-nondetect J-Detect)~~ RBC for RJS

Nitrite - 2 days ~~(7 days) >2x Limit (UR-nondetect, J-Detect)~~ RBC for RJS

O-Phosphate - 2 days ~~(7 days) >2x limit (UR-nondetects, J-Detects)~~ RBC for RJS

NO_3/NO_2 - 28 days ✓

Sulfide - ~~28~~ 7 days ✓

TOX - 28 days ✓

Sulfate - 28 days ✓

4/5/95

~~A-23~~

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

3. INSTRUMENT CALIBRATION

Was initial calibration performed for all applicable analyses? Yes No N/A
Are initial calibration results acceptable? . . . . . Yes No N/A
Was a calibration check performed for all applicable analyses? Yes No N/A
Are calibration check results acceptable? . . . . . Yes No N/A
Comments:

4. BLANKS

Were laboratory blanks analyzed? . . . . . Yes No N/A
Are laboratory blank results acceptable? . . . . . Yes No N/A
Were field/trip blanks analyzed? . . . . . Yes No N/A
Are field/trip blank results acceptable? . . . . . Yes No N/A
Comments:

5. ACCURACY

Were spike samples analyzed at the required frequency? . . . . Yes No N/A
Are spike recoveries acceptable? . . . . . Yes No N/A
Were LCS analyses performed at the required frequency? . . . . Yes No N/A
Are LCS recoveries acceptable? . . . . . Yes No N/A
Comments:

6. PRECISION

Were laboratory duplicate samples analyzed
at the required frequency? . . . . . Yes No N/A
Are laboratory duplicate sample RPD values acceptable? . . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A

GENERAL CHEMISTRY DATA VALIDATION CHECKLIST

Comments:

7. ANALYTE QUANTITATION

Was analyte quantitation performed properly? . . . . . Yes No N/A

Comments:

8. REPORTED RESULTS AND DETECTION LIMITS

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

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

Are results calculated properly? . . . . . Yes No N/A

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

Comments:

HOLDING TIME SUMMARY

SDG: W0430	VALIDATOR: RJS	DATE: 4/11/95	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
BODMT4	Nitrate	1/27/95	2/03/95	2/03/95	—	7	J
BODMT4	Nitrite	1/27/95	2/03/95	2/03/95	—	7	UR
BODMT4	Phosphate	1/27/95	2/3/95	2/3/95	—	7	UR

BTK

000031

96134510941

RECORD COPY

MAY 1995

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Inorganics - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-QES prepared by Quanterra Environmental Services (QTES). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
B0DMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: SW-846/ICP Metals, SW-846/GFAA Metals

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

  Holding time requirements for all analytes were met.

- **Blanks**

Calibration Blanks

A calibration blank must be analyzed immediately after every initial and continuing calibration verification. The blank must be analyzed at the beginning of the run and after the last analytical sample. In the case of positive blank results, samples with digestate concentrations (in ug/L) of <5x the highest amount found in any of the associated blanks have had their associated values qualified as non-detected and flagged "U". Samples with concentrations >5x the highest blank value do not require qualification.

In the case of negative calibration blank results, if the absolute value of any calibration blank exceeds the Instrument Detection Limit (IDL), all non-detects are qualified as estimates and flagged "UJ", and all positive results within two times (2x) the absolute value of the blank result are qualified as estimates and flagged "J". The qualification is applied only to results generated between the calibration blank IDL and the nearest acceptable blank.

All calibration blank results were acceptable.

Preparation Blanks

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

In the case of negative blank results, if the absolute value exceeds the Contract Required Detection Limit (CRDL), all non-detects are rejected and flagged "UR" and all detects that are <10x the absolute value of the associated preparation blank result are qualified as estimates and flagged "J". If the absolute value of the negative preparation blank is >IDL and ≤CRDL, all non-detects are qualified as estimates and flagged "UJ" and all detects <10x the absolute value of the blank are qualified as estimates and flagged "J". If the sample results are >10x the absolute value of the preparation blank, no qualification is necessary.

Due to the presence of negative preparation blank results, sample number B0DMT4 was flagged "BJ" for beryllium.

All other preparation blanks results were acceptable.

- **Accuracy**

Matrix Spike

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

The matrix spike recovery fell outside QC limits and the associated result was flagged "BJ" for antimony in sample number B0DMT4.

The matrix spike recovery fell outside QC limits and the associated result was flagged "J" for manganese in sample number B0DMT4.

The matrix spike recovery fell outside QC limits and the associated result was flagged "UJ" for thallium in sample number B0DMT4.

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 was digested and analyzed for each sample batch in this report that contained water samples.

All LCS results were found to be acceptable.

- **Precision**

Laboratory Duplicate Samples

The laboratory duplicate result measures the precision of the method by measuring a second aliquot of the sample that is treated the same way as the original. Samples whose precision fell outside the quality control requirements were qualified as estimates and flagged "J".

All laboratory duplicate recovery results were acceptable.

ICP Serial Dilution

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

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

- **Furnace AA Quality Control**

The post-digestion analytical spike is analyzed to determine the extent of interference in the digestate matrix. When the result of the analytical spike analysis exceeds the control window of 85% to 115% recovery and the absorbance of the sample is >50% of the analytical spike absorbance, then the sample must be reanalyzed using the MSA. The duplicate injections and the analytical spike recoveries establish the precision and accuracy of the individual GFAA determinations.

Duplicate Injections

Each furnace analysis requires a minimum of two injections (burns), except for full MSA. For concentrations >CRDL, the duplicate injection readings must agree within 20% RSD or CV. If these requirements are not met, the analytical sample must be rerun once (i.e., two additional burns). If the readings are then still outside the QC limits, the result is qualified as an estimate and flagged "J".

All duplicate injection quality control requirements were met.

Analytical Spike Recoveries

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

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

- **Sample Result Verification and Detection Limits**

Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors.

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

- **Completeness**

Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Negative blank contamination was noted for beryllium. Sample results were quailified accordingly. The results, however, were not sufficiently high to affect the usability of the data. Due to matrix spike recovery problems, antimony, manganese and thallium results were qualified as estimates and flagged "J". Data flagged "J" indicate the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

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

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

EPA, 1988d, *Laboratory Data Validation Functional Guidelines for Evaluating Inorganics Analyses*, U.S. Environmental Protection Agency, Washington, D.C.

EPA, 1990, *EPA Contract Laboratory Program Statement of Work for Inorganic Analyses, Multi-media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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

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Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W0430	REVIEWER: RJS	DATE: 4/5/95	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIERS	SAMPLES AFFECTED	REASON
Beryllium	BJ	B0DMT4	Negative preparation blank contamination
Antimony	BJ	B0DMT4	Matrix spike
Manganese	J	B0DMT4	Matrix spike
Thallium	UJ	B0DMT4	Matrix spike

9613451.0952

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

INORGANIC ANALYSIS, SOIL MATRIX, (mg/Kg)

Project: WESTINGHOUSE-HANFORD																							
Laboratory: Quanterra																							
Case	SDG: W0430																						
Sample Number		B0DMT4																					
Location		Test Pit #2																					
Remarks	MG/KG	Soil																					
Sample Date		01/27/95																					
Inorganic Analytes	CRDL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	20	4010																					
Antimony	10	6.3	BJ																				
Arsenic	1	0.68																					
Barium	20	93.5																					
Beryllium	0.7	0.45	BJ																				
Cadmium	2	0.41	U																				
Calcium	500	4020																					
Chromium	2	4.9																					
Cobalt	5	13.0																					
Copper	2.5	14.5																					
Iron	10	13400																					
Lead	0.3	1.7																					
Magnesium	500	4060																					
Manganese	1.5	311	J																				
Nickel	4	7.1																					
Potassium	500	477																					
Selenium	0.5	0.11	U																				
Silver	20	0.41	U																				
Sodium	100	129																					
Thallium	1	0.1	UJ																				
Vanadium	5	68.7																					
Zinc	2	56.2																					

RJS 5/3/95

FIL = Filtered, NA = Not Analyzed, N/A = Not Applicable

9615.0953

000122

9613451.0954

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

B0DMT4

Lab Name: QUANTERRA_MO Contract: 550.56

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

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

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

% Solids: 93.5

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	4010			P	
7440-36-0	Antimony	6.3	~~B~~		P	BJ
7440-38-2	Arsenic	0.68	B		F	
7440-39-3	Barium	93.5			P	
7440-41-7	Beryllium	0.45	~~B~~		P	BJ
7440-43-9	Cadmium	0.41	U		P	
7440-70-2	Calcium	4020			P	
7440-47-3	Chromium	4.9			P	
7440-48-4	Cobalt	13.0			P	
7440-50-8	Copper	14.5			P	
7439-89-6	Iron	13400			P	
7439-92-1	Lead	1.7			F	
7439-95-4	Magnesium	4060			P	
7439-96-5	Manganese	311			P	J
7440-02-0	Nickel	7.1			P	
7440-09-7	Potassium	477	B		P	
7782-49-2	Selenium	0.11	U		F	
7440-22-4	Silver	0.41	U		P	
7440-23-5	Sodium	129			P	
7440-28-0	Thallium	0.10	~~U~~		F	UJ
7440-62-2	Vanadium	68.7			P	
7440-66-6	Zinc	56.2			P	

Color Before: Clarity Before: Texture:

Color After: Clarity After: Artifacts:

Comments:

RJS 4/24/95

FORM I - IN

SW-846

9613451.0955

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

9613451.0956

Quanterra Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

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

March 7, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 30, 1995
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Standalone

I. Introduction

On January 30, 1995, one (1) soil sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7444-008	B0DMT4	50151712	Soil	01/30/95

II. Analytical Results/ Methodology

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

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

~~000071~~

Quanterra
Environmental Services

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0403 after analysis had been done, therefore matrix QC associated with SDG W0403 is included in this SDG to meet requirements.

IV. Definitions

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

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

V. Comments

Samples that arrived in St. Louis on January 30, 1995 were received at 0°C and 1 °C which is not within the recommended 4°C ± 2°C.

Samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DV1, and B0DMV2 are reported in SDG W0403 as a summary package. Sample B0DMT4 is reported in SDG W0430 as a standalone package. See ROD-B95-013.

Sample 7444-001 is included in this package only for the purpose of verifying matrix QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the VOA or BNA analyses.

Continuing Calibrations had several compounds with %Difference greater than 15, but there are no positive hits for these compounds in the sample so the analsis is valid as is.

Matrix Spike and Matrix Spike Duplicate for antimony were outside of suggested limits of 75-125 percent on sample 7444-001.

Quanterra
Environmental Services

Matrix Spike Duplicate for thallium was outside of suggested limits of 75-125 percent on sample 7444-001.

Nitrate, nitrite, and phosphate hold times expired upon receipt.

Relative Percent Difference for fluoride, chloride, phosphate, and nitrite could not be calculated due to values being below the detection limits on sample 7444-001.

Relative Percent Difference for sulfide could not be calculated due to values being below the detection limit on sample 7444-001.

Relative Percent Difference for TOX could not be calculated due to values being below the detection limit on sample 7444-001.

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:\\sqtmlo01\price$\abbydave\hanford\hanw0430.nar

1/27/95 DAS

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 13

Data Turnaround: [ ] Priorty [X] Normal

WS Thompson/Amy Simpson

Collector: Dave St. John / Doug Bauer	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: Er-80	Field Logbook No.:	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks:		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4		COOL 4					
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	P/G	P/G	P/G		
No. of Container(s)	1	1	1	1	1	1	1	1	wst 1-27-95 ~~1~~	1	1	3	2		
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml*	500ml*	950ml		
SAMPLE ANALYSIS	ICP METALS-TAL/AA MATALS (As,Pb, Se,Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA 501518	ACTIVITY SCAN	total alpha beta GEA	total alpha beta GEA	total alpha beta GEA		

1-27-95 501517

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	501518	D					
~~BOD1173~~ BODMT9	17 S	1-27-95	0910	X						X	X		X					
BODMT4 12	S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X			12	
BODMR4	13 S	1-27-95	0930	X	X	X	X	X	X	X	X	wst 1-27-95	X		X		13	
BODMR5	14 S	1-27-95	1055	X	X	X	X	X	X	X	X	X	X		X		14	
BODMX5	15 S	1-27-95	1120	X	X	X	X	X	X	X	X	X	X		X		15	
BODMS3	16 S	1-27-95	1345	X	X	X	X	X	X	X	X	X	X			X	16	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: David St. John / David St. John ERC	Date/Time: 1/30/95 0830	Received By: ERC / Bakthen	Date/Time: 0830 1-30-95
Relinquished By: ERC / Bakthen	Date/Time: 10:40 1-30-95	Received By: Quanterra / Karen Ackterberg	Date/Time: 10:40 1-30-95
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

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

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

Correction from 1 500ml to 3, 500ml jars. wrong but initially checked, corrected in field. Sandy S Thompson 1-27-95

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
			SDG W0403

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

9513196.0868

9613451.0960

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

DATE: 01/31/95 | **LABORATORY: Quanterra**

PROJECT TITLE/NO.: 100-B Ponds/B94-099 | **NCR NO.: N/A**

SAMPLE IDENTIFICATION NUMBERS:

W0429 ~~W0386~~ 50132209 +05 32303 +05

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable) W0386

W0430 ~~W0403~~ 50151712 + 51812

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable) W0403

DESCRIPTION OF EVENT:

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

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

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

DISPOSITION OF SAMPLES:

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

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

APPROVAL SIGNATURES:

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

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

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

OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

RCS 1/17/95

REV. 3 . DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY:
1. EXPEDITED RESPONSE ACTION
2. ✓ TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA ✓ RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY ✓ REGULAR ✓ RADCHEM

SAMPLE MATRIX: ✓ SOIL/SEDIMENT WATER VEGETATION OILS
SLUDGE CONCRETE OTHER _____

LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
Quanterra (Main)	Not Applicable	N/A
Lockheed (Split)	Not Applicable	N/A

COMMENTS:

▸▸ Revision 1 — Changes to the EAL bottle requirements.

▸▸ Revision 2 — Change to laboratories.

▸▸ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

▸▸ Data Deliverable — Standalone

▸▸ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

9613451.0962

Appendix 5

Data Validation Supporting Documentation

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	(D)	E
PROJECT: BHI/WHC			DATA PACKAGE: W0430-QES		
VALIDATOR: RJS		LAB: Quanterra		DATE: 3/28/95	
CASE: 100-DR-1		100-D Ponds	SDG: W0430		
ANALYSES PERFORMED					
☐ CLP/ICP	☐ CLP/GFAA	☐ CLP/Hg	☐ CLP/Cyanide	☐	☐
☒ SW-846/ICP	☒ SW-846/GFAA	☐ SW-846/Hg	☐ SW-846 Cyanide	☐	☐
SAMPLES/MATRIX					
BODMT4 (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: Metals < 6 months

~~A-19/5~~

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:

Be – neg Prep blank

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:

Sb (56.7%) – BJ

Mn (145.2%) – J

Tl (63.2%) – UJ

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST

6. PRECISION

Were laboratory duplicates analyzed? . . . . . Yes No N/A
Are laboratory duplicate samples RPD values acceptable? . . . . Yes No N/A
Were ICP serial dilution samples analyzed? . . . . . Yes No N/A
Are ICP serial dilution %D values acceptable? . . . . . Yes No N/A
Are field duplicate RPD values acceptable? . . . . . Yes No N/A
Are field split RPD values acceptable? . . . . . Yes No N/A

Comments: NO ICP Serial dilution analysis was performed with this SDG#, ~~therefore all results are qualified as estimates and flagged (UJ, BJ, *)~~ RS.

* No qualification of data was necessary since SW-846 methods do not require dilution analysis unless sample concentration is greater than the linear Range.

7. FURNACE AA QUALITY CONTROL

Were duplicate injections performed as required? . . . . . Yes No N/A
Are duplicate injection %RSD values acceptable? . . . . . Yes No N/A
Were analytical spikes performed as required? . . . . . Yes No N/A
Are analytical spike recoveries acceptable? . . . . . Yes No N/A
Was MSA performed as required? . . . . . Yes No N/A
Are MSA results acceptable? . . . . . Yes No N/A

Comments:

NO GFAA analytical spike analysis. NO data qualified since Guidelines reference laboratory criteria which doesn't require GFAA spike to be run.

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:

ACCURACY DATA SUMMARY

SDG: W0430	VALIDATOR: RJS	DATE: 3/28/95	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
BODMS4S	Antimony	56.7	BODMT4	BJ
BODMS4S	Manganese	145.2	BODMT4	J
BODMS4S	thallium	63.2	BODMT4	UJ

WHG-SP-EN-SPP-002, Rev. 2
96135150.0962

BLANK AND SAMPLE DATA SUMMARY

SDG: W0430	VALIDATOR: RJS	DATE: 3/28/95	PAGE 1 OF 1

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
Prep	Beryllium	-0.1			mg/kg	-.5	-1.0	BODMT4	BJ

96 MAR 29 PM 1:07
SDMS-DNAPP-002, Rev. 2

9613451.0968

DATA QUALIFICATION SUMMARY

SDG: W0430	VALIDATOR: RJS	DATE: 3/28/95	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Antimony	BJ	BODMT4	matrix Spike
Beryllium	BJ	↓	Neg Prep blank
Manganese	J		matrix Spike
Thallium	UJ		matrix Spike

B-78

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U.S. EPA - CLP

3
BLANKS

b Name: QUANTERRA_MO_____ Contract: 550.56____

b Code: ITMO__ Case No.: _____ SAS No.: _____ SDG No.: W0430_____

eparation Blank Matrix (soil/water): SOIL_

eparation Blank Concentration Units (ug/L or mg/kg): MG/KG

nalyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
luminum	23.5	U	23.5	U	23.5	U	23.5	U	2.350	U	P
ntimony	32.8	U	32.8	U	32.8	U	32.8	U	3.280	U	P
rsenic	1.2	U	1.2	U	1.2	U	1.2	U	0.120	U	F
arium	0.5	U	0.5	U	0.5	U	0.5	U	-0.089	B	P
eryllium	-0.4	B	-0.3	B	0.2	U	-0.2	B	-0.100	B	P
admium	3.8	U	3.8	U	3.8	U	3.8	U	0.380	U	P
alcium	41.5	U	41.5	U	41.5	U	41.5	U	4.150	U	P
hromium	2.9	U	2.9	U	2.9	U	2.9	U	0.290	U	P
obalt	4.1	U	4.1	U	4.1	U	4.1	U	0.410	U	P
opper	4.3	B	5.1	B	5.8	B	3.2	U	0.320	U	P
ron	-8.4	B	4.3	U	4.3	U	4.3	U	7.232	B	P
ead	0.8	U	0.8	U	0.8	U	0.8	U	0.080	U	F
agnesium	71.5	B	115.9	B	105.0	B	56.9	B	4.480	U	P
anganese	0.8	U	0.8	U	0.8	U	0.8	U	-0.091	B	P
ickel	15.2	U	15.2	U	15.2	U	15.2	U	1.520	U	P
otassium	2670.0	U	2670.0	U	2670.0	U	2670.0	U	267.000	U	P
elenium	1.0	U	1.0	U	1.0	U	1.0	U	0.100	U	F
ilver	3.8	U	3.8	U	3.8	U	3.8	U	0.380	U	P
odium	33.9	B	49.0	B	62.2	B	33.9	B	2.670	U	P
hallium	0.9	U	0.9	U	0.9	U	0.9	U	0.090	U	F
anadium	2.5	U	5.4	B	4.8	B	2.5	U	-0.425	B	P
inc	5.2	U	5.2	U	5.2	U	5.2	U	0.520	U	P

BODMT4

(Fe) only

FORM III - IN

SW-846

ug/L → mg/kg

~~0000739~~

9613451.0970

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

B0DMS4S

b Name: QUANTERRA_MO Contract: 550.56

b Code: ITMO Case No.: SAS No.: SDG No.: W0430

trix (soil/water): SOIL Level (low/med): LOW

Solids for Sample: 96.2

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
luminum									NR
ntimony	75-125	37.3306		7.8378	B	51.98	56.7	N	P
rsenic	75-125	4.3514		0.7308	B	4.16	87.0		F
Barium	75-125	303.5457		107.4272		207.90	94.3		P
Beryllium	75-125	5.7277		0.4854	B	5.20	100.8		P
Cadmium	75-125	5.4085		0.3950	U	5.20	104.0		P
Calcium									NR
Chromium	75-125	25.2484		4.6351		20.79	99.2		P
Cobalt	75-125	62.3420		11.8441		51.98	97.1		P
Copper	75-125	40.2308		14.7921		25.99	97.9		P
Iron									NR
Lead	75-125	56.4501		5.0010		51.98	99.0		P
Magnesium									NR
Manganese		349.1237		273.6341		51.98	145.2		P
Nickel	75-125	57.0239		7.8576		51.98	94.6		P
Potassium									NR
Selenium	75-125	1.0593		0.1040	U	1.04	101.9		F
Silver	75-125	5.0166	B	0.3950	U	5.20	96.5		P
Sodium									NR
Thallium	75-125	3.2848		0.0936	U	5.20	63.2	N	F
Vanadium	75-125	113.2349		58.6819		51.98	104.9		P
Zinc	75-125	98.1081		43.5520		51.98	105.0		P

omments:

FORM V (Part 1) - IN SW-846

~~0000742~~

9613451.0971

APR 1995
RECEIVED
Validation
Log in

RECORD COPY

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Volatiles - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-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
BODMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: VOA-TCL

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

  If holding times are exceeded, but not by >2x the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-

detects. If holding times are exceeded by >2x the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times were met for all samples.

- **Instrument Calibration and Tuning**

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

All initial and continuing calibration results were acceptable.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at <5X the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at <10x the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is <CRQL and is <10x (or <5x for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualifed as undetected "U". Tentatively identified compounds (TIC) present in the samples and blanks that are within +/-0.06 relative retention time units (RRT) of each other are qualified as undetected "U" if the sample concentration is <5x (or <10x for common laboratory contaminants) the highest blank concentration.

Due to the presence of positive blank results, sample number B0DMT4 was flagged "U" for methylene chloride.

All other method blank results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate using five compounds and % recoveries must be within established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results <5x the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results >5x the spike concentration require no qualification.

All matrix spike results were acceptable.

Surrogate Recovery

The analyses of surrogate compounds provide a measure of performance for individual samples. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates and flagged "J". Undetected compounds with surrogate recoveries less than the lower control limit are qualified as having an estimated detection limit and flagged "UJ". Compounds with surrogate recoveries <10% are qualified as estimates "J" for detects, and "UR" for nondetects. Undetected compounds with surrrogate recoveries greater than the upper control limit require no qualification.

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples analyzed using SW-846 protocol, results must be within RPD limits of +/-35%. If RPD values are out of specification and the sample concentration is <5x the spike concentration, all associated sample results are qualified as estimated "J" for detects, "UJ" for non-detects. If RPD values are out of specification and the sample concentration is >5x the spike concentration, no qualification is required.

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

- **System Performance**

Internal Standards Performance

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

All internal standard recovery results were acceptable.

Compound Identification

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

All compounds were identified correctly.

- **Sample Result Verification and Detection Limits**

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

All sample results and reported detection limits were acceptable.

- **Completeness**

  Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Positive blank contamination was noted in one methylene chloride result. All results were flagged acordingly. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

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

EPA, 1991b, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene Chloride	U	B0DMT4	Lab Blank Contamination

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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

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

RBC 4-18-95

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000011

9613451.0982

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT4

Lab Name: QUANTERRA MO Contract: 550-56

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

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

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

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

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

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

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

3/30/95 SC 000012 ~~0015~~

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EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B0DMT4

Lab Name: QUANTERRA MO Contract: 550-56

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

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

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

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

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

Column (pack/cap) CAP Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

FORM I VOA-TIC 1/87 Rev.

3/30/95 SC

~~0018~~

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra
Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

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

March 7, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 30, 1995
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Standalone

I. Introduction

On January 30, 1995, one (1) soil sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7444-008	B0DMT4	50151712	Soil	01/30/95

II. Analytical Results/ Methodology

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

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

Quanterra
Environmental Services

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0403 after analysis had been done, therefore matrix QC associated with SDG W0403 is included in this SDG to meet requirements.

IV. Definitions

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

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

V. Comments

Samples that arrived in St. Louis on January 30, 1995 were received at 0°C and 1 °C which is not within the recommended 4°C ± 2°C.

Samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DV1, and B0DMV2 are reported in SDG W0403 as a summary package. Sample B0DMT4 is reported in SDG W0430 as a standalone package. See ROD-B95-013.

Sample 7444-001 is included in this package only for the purpose of verifying matrix QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the VOA or BNA analyses.

Continuing Calibrations had several compounds with %Difference greater than 15, but there are no positive hits for these compounds in the sample so the analsis is valid as is.

Matrix Spike and Matrix Spike Duplicate for antimony were outside of suggested limits of 75-125 percent on sample 7444-001.

Quanterra
Environmental Services

Matrix Spike Duplicate for thallium was outside of suggested limits of 75-125 percent on sample 7444-001.

Nitrate, nitrite, and phosphate hold times expired upon receipt.

Relative Percent Difference for fluoride, chloride, phosphate, and nitrite could not be calculated due to values being below the detection limits on sample 7444-001.

Relative Percent Difference for sulfide could not be calculated due to values being below the detection limit on sample 7444-001.

Relative Percent Difference for TOX could not be calculated due to values being below the detection limit on sample 7444-001.

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:\\sqtmlo01\price$\abbydave\hanford\hanw0430.nar

1/27/95 DAS

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 13

Data Turnaround: [ ] Priorty [X] Normal

WS Thompson/Amy Simpson

Collector: Dave St. John / Doug Bauer	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: Er-80	Field Logbook No.:	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks:		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

SAMPLE ANALYSIS 1-27-95 501517

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP METALS-TAL/AA MATALS (As,Pb, Se,Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN				
Preservative				COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4		COOL 4				
Type of Container				aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	P/G	P/G	P/G	
No. of Container(s)				1	1	1	1	1	1	1	1	1	1	1	3	2	
Volume				125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml*	500ml*	950ml	
														total alpha beta GEA	total alpha beta GEA	total alpha beta GEA	
~~BOD1173~~ BODMT9	17 S	1-27-95	0910	A						B	C		D				
BODMT4 12	S	1-27-95	0930														12
BODMR4	13 S	1-27-95	0930														13
BODMR5	14 S	1-27-95	1055														14
BODMX5	15 S	1-27-95	1120														15
BODMS3	16 S	1-27-95	1345														16

1-27 WSH

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
David St. John / David St. John ERC	1/30/95 0830	ERC / Bakthen	0830 1-30-95
ERC / Bakthen	10:40 1-30-95	Quanterra / Quanterra / Karen Rettenberg	10:40 1-30-95

SPECIAL INSTRUCTIONS

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

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

Correction from 1 500ml to 3 500ml jars. wrong but initially checked, corrected in field. Sandy J Thompson 1-27-95

Matrix*

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

LABORATORY SECTION — Received By | Title | Date/Time

SDG W0403

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

AA9 4R

9613245.0980

9613451.0989

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-895-013
Record of Disposition No.

DATE: 01/31/95

LABORATORY: Quanterra

PROJECT TITLE/NO.: 100-D Ponds/884-088

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

W0429 ~~W0386~~ 50132209 +05 32303 +05

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable) W0386

W0430 ~~W0403~~ 50151712 + 51812

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable) W0403

DESCRIPTION OF EVENT:

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

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

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

DISPOSITION OF SAMPLES:

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

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

APPROVAL SIGNATURES:

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

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

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

OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

RCS 1/17/95

REV. 3 . DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY:
1. EXPEDITED RESPONSE ACTION
2. ✓ TPA RANKING
3. NON-TPA RANKING

ANALYTICAL PROTOCOLS: CERCLA ✓ RCRA OTHER (specify)

DATA TURNAROUND REQUIREMENTS: PRIORITY ✓ REGULAR ✓ RADCHEM

SAMPLE MATRIX: ✓ SOIL/SEDIMENT WATER VEGETATION OILS
SLUDGE CONCRETE OTHER

LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
Quanterra (Main)	Not Applicable	N/A
Lockheed (Split)	Not Applicable	N/A

COMMENTS:

▸▸ Revision 1 — Changes to the EAL bottle requirements.

▸▸ Revision 2 — Change to laboratories.

▸▸ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

▸▸ Data Deliverable — Standalone

▸▸ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

~~PAGE 1 OF 01~~

9613451.0991

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

ATION:	A	B	C	D	E
CT: WHC			DATA PACKAGE: SAF-B94-098		
ATOR: S. Chan	LAB:			DATE: ~~W0430~~ 3/30/95	
V44408			SDG: W0430		

ANALYSES PERFORMED

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

ES/MATRIX Soil

BODMT4

ATA PACKAGE COMPLETENESS AND CASE NARRATIVE

chnical verification documentation present? . . . . . Yes No N/A

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

ents:

HOLDING TIMES

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

ents:

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

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

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

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

Comments:

4. BLANKS

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

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

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

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

Comments:

"U" for Methylene Chloride-detect in lab blank

5. ACCURACY

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

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

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

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

Comments:

A-BC

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

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

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

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

SC 3/30/95

Comments:

7. SYSTEM PERFORMANCE

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

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

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

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

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

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

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

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

3/30/95 SC

Comments:

BLANK AND SAMPLE DATA SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1
COMMENTS:			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VSPK01	Methylene Chloride	3	J		ug/Kg	15	30	B0DMT4	U

000025

96194S1.0096

HOLDING TIME SUMMARY

SDG: W0430	REVIEWER: SC			DATE: 3/30/95		PAGE 1 OF 1	
COMMENTS: No problems. All within limits							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER

9613451.0996

CALIBRATION DATA SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1
COMMENTS: All within limits			
CALIB. TYPE: INITIAL CONTINUING		INSTRUMENT:	

CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER

000027

96134S.099

ACCURACY DATA SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1	
COMMENTS: All within limits.				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED

000028

96134519.0998

PRECISION DATA SUMMARY

SDG: W0429	REVIEWER: SC	DATE: 3/28/95	PAGE 1 OF 1
COMMENTS: All within limits.			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER

96134519.0999

000029

9613451.1000

RECORD COPY

APR 1995
RECEIVED
Validation
Log In

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 D-Ponds Phase II Sampling
Subject: Radiochemistry - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-QES prepared by Quanterra Environmental Services (QTES). A list of samples validated along with the analyses reported and the method of analysis is provided in the following table.

Sample ID	Sample Date	Media	Validation Level	Analysis
B0DMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: Gross Alpha/Beta and Gamma Spectropcopy

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times and Sample Preparation**

  Holding times are calculated from Chain-of-Custody forms to determine the validity of the results. The maximum holding time for radiochemical analyses is six months.

  All holding times and sample preparation measures were acceptable.

- **Instrument Calibration and Performance**

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

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

- **Blanks**

  Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination. If blank analysis results indicate the presence of an analyte above the MDA, the following qualifiers were applied: All positive sample results less than five times the highest blank concentration were qualified as estimated; sample results below the MDA were elevated to the MDA and qualified as undetected; sample results above the MDA and greater than five times the highest blank concentration were not qualified.

  All blank results were acceptable.

  Field Blanks

  SDG No. W0430-QES contained no field blanks.

- **Accuracy**

  Accuracy is evaluated by analyzing distilled water samples spiked with known amounts of radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable laboratory control sample recovery range is 70 to 130 percent, while that for a matrix spike is 60 to 140 percent. Spike sample results outside the above ranges results in associated sample results being qualified as estimated, rejected, or not qualified, depending on the activity of the individual sample. A chemical tracer is used to determine the efficiency of the analytical method, with tracer yield limits of 30 to 105 percent for strontium-90 and technetium-99. Sample results above the MDA with chemical yields outside the above stated limits were qualified as estimated or rejected.

  All accuracy results were acceptable.

- **Precision**

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

  All precision results were acceptable.

- **Sample Result Verification and Detection Limits**

  Sample results and reported detection limits were recalculated to ensure that the reported results were accurate. Raw data were examined for anomalies, transcription errors, and reduction errors. Minimum Detectable Activities (MDA) for each analyte were assessed to ensure that they met the contract required dectection levels (CRDL).

  The reviewer verified that the results and detection limits fell within the linear range of the instrument. The MDA for Fe-59 exceeded the CRDL. In accordance with WHC guidelines, no qualification was required.

  All sample results were acceptable.

- **Completeness**

  Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES.

None found.

REFERENCES

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

WHC, 1992b, *Data Validation Procedures for Radiochemical Analyses*, WHC-SD-EN-001, Rev. 1, Westinghouse Hanford Company, 1993.

Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

9613451.1006

Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W0430	REVIEWER: RBC	DATE: 14/04/95	PAGE 1 OF 1
COMMENTS: No Qualifiers Assigned			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

RADIOCHEMISTRY ANALYSIS, SOIL MATRIX, (pCi/g + – 2 standard deviations)

Project: WESTINGHOUSE–HANFORD																					
Laboratory: QES																					
Case	SDG: WO430																				
Sample Number		B0DMT4																			
Location		100–D																			
Remarks	pCi/g	Soil																			
Sample Date		01/27/95																			
Radiochemistry Analysis		Result	Q		Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha		1.90	U																		
Gross Beta		15.9																			
Cobalt–58		0.00435	U																		
Cobalt–60		0.0119	U																		
Cesium–137DA		0.0254																			
Europium–152		0.0186	U																		
Europium–154		–0.0058	U																		
Europium–155		0.0301	U																		
Iron–59		–0.0477	U																		
Potassium–40		9.42																			
Radium–224DA		0.414																			
Radium–226DA		0.367																			
Radium–228DA		0.442																			

RDS 5/3/95

A000098

9613451.009

9613451.1010

Quanterra Environmental Services

SAMPLE RESULTS

LAB NAME:	ITAS-RICHLAND	SDG:	W0430
LAB SAMPLE ID:	50151812	MATRIX:	SOIL
CLIENT ID:	B0DMT4	DATE RECEIVED:	1/30/95

ISOTOPE	RESULT	COUNTING ERROR (2s)	TOTAL ERROR (2s)	MDA	REPORT UNIT	YIELD	METHOD NUMBER
CO-58	4.35E-03 U	1.2E-02	1.2E-02	2.06E-02	pCi/g	N/A	RD3219
CO-60	1.19E-02 U	1.0E-02	1.0E-02	1.90E-02	pCi/g	N/A	RD3219
CS-137DA	2.54E-02	1.4E-02	1.4E-02	N/A	pCi/g	N/A	RD3219
EU-152	1.86E-02 U	2.6E-02	2.6E-02	4.23E-02	pCi/g	N/A	RD3219
EU-154	-5.84E-03 U	3.1E-02	3.1E-02	5.33E-02	pCi/g	N/A	RD3219
EU-155	3.01E-02 U	2.2E-02	2.3E-02	3.84E-02	pCi/g	N/A	RD3219
FE-59	-4.77E-02 U	3.3E-02	3.4E-02	5.04E-02	pCi/g	N/A	RD3219
K-40	9.42E+00	4.3E-01	1.0E+00	N/A	pCi/g	N/A	RD3219
RA-224DA	4.14E-01	2.8E-02	5.0E-02	N/A	pCi/g	N/A	RD3219
RA-226DA	3.67E-01	4.0E-02	5.5E-02	N/A	pCi/g	N/A	RD3219
RA-228DA	4.42E-01	6.7E-02	8.0E-02	N/A	pCi/g	N/A	RD3219
ALPHA	1.90E+00 U	2.7E+00	2.7E+00	5.34E+00	pCi/g	100.00%	RD3222
BETA	1.59E+01	3.0E+00	3.2E+00	3.66E+00	pCi/g	100.00%	RD3222

Number of Results: 13

RBC
30-3-95

~~AOOO~~ RBC

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

9613451.1012

Quanterra Environmental Services

Quanterra Incorporated
2800 George Washington Way
Richland, Washington 99352

509 375-3131 Telephone
509 375-5590 Fax

CERTIFICATE OF ANALYSIS

MAR 1995
RECEIVED
Data
Log In

Bechtel Hanford, Inc.
345 Hills
Richland, WA 99352

March 16, 1995

Attention: Joan Kessner

SAF Number	:	B94-098
Date SDG Closed	:	January 30, 1995
Number of Samples	:	One (1) - See ROD-B95-013
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Stand Alone

I. Introduction

On January 30, and February 1, 1995, a total of nineteen soil samples were received by the Quanterra Environmental Services Richland Laboratory (QTESRL) for radiochemical analysis. After receipt, per ROD-B95-013, the samples were split into two separate SDGs for reporting purposes. The samples were assigned the following laboratory ID numbers to correspond with the Bechtel Hanford, Inc. (BHI) specific IDs:

QTESRL ID	BHI ID	Matrix	Date of Receipt
50151812	B0DMT4	Soil	1/30/95

II. Analytical Results/Methodology

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

AA1736

The requested analyses were:

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

III. Quality Control

The analytical results for each analysis performed under SDG W0430 include a minimum of one Laboratory Control Sample (LCS), one method (reagent) blank, and one duplicate. Any exceptions have been noted in the "Comments" section.

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

IV. Comments

Samples submitted as a single SDG, SDG W0403 (stand alone), were split into two SDGs after analysis had been started, W0403 (summary) and W0430 (stand alone), as per ROD-B95-013.

Gamma Spectroscopy

Gamma Scan by method ITAS-RD-3219
The LCS, batch blank, sample and sample duplicate (B0DMR7, SDG W0403) results are within contractual requirements.

Gas Proportional Counting

Gross Alpha by method ITAS-RD-3222
The batch was analyzed with two LCS samples. The soil lab is undergoing an investigation into the cause of a low spike bias for water spikes prepared in that area, and is preparing duplicate spikes for soil batches. LCS M015182S, which contains an iron carrier, is not used for reporting purposes. The LCS samples were recounted due to unacceptable recoveries and the recount result is accepted for M015181S. The LCS, batch blank, sample and sample duplicate (B0DMR6, SDG W0403) results are within contractual requirements, except as noted.

Quanterra
Environmental Services

Gross Beta by method ITAS-RD-3222
The LCS, batch blank, sample and sample duplicate (B0DMR6, SDG W0403) results are within contractual requirements.

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

Reviewed and approved:

Suzanne Gaines

Suzanne Gaines
Project Manager

~~000526~~

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 13

Data Turnaround: [ ] Priorty [X] Normal

Collector: WS Thompson/Amy Simpson, Dave St. John/Doug Bauer

Company Contact: RC SMITH/MT STANKOVICH

Telephone No.: (509)372-2537/(509)376-2493

Project Designation: 100-D PONDS PHASE II SAMPLING

Sampling Location: 100-D

SAF No.: B94-098

Ice Chest No.: Er-80

Field Logbook No.:

Method of Shipment: HAND DELIVER

Shipped To: QUANTERRA

Offsite Property No.: N/A

Bill of Lading/Air Bill No.: N/A

Possible Sample Hazards/Remarks:

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

SAMPLE ANALYSIS: 1-27-95 501517

Sample No.	Matrix*	Date Sampled	Time Sampled	ICP METALS-TAL/AA MATALS (As,Pb, Se,Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA	ACTIVITY SCAN				
Preservative				COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4		COOL 4				
Type of Container				aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	P/G	P/G	P/G	
No. of Container(s)				1	1	1	1	1	1	1	1	1	1	1	3	2	
Volume				125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml*	500ml*	950ml	
BODMT9	17 S	1-27-95	0910	A						G	H		D				
BODMT4	12 S	1-27-95	0930														12
BODMR4	13 S	1-27-95	0930														13
BODMR5	14 S	1-27-95	1055														14
BODMX5	15 S	1-27-95	1120														15
BODMS3	16 S	1-27-95	1345														16

CHAIN OF POSSESSION — Sign/Print Names

Relinquished By	Date/Time	Received By	Date/Time
David St. John ERC	1/30/95 0830	ERC Bakker	0870 1-30-95
ERC Bakker	10:40 1-30-95	Quanterra Hansen Rottenberg	10:40 1-30-95

SPECIAL INSTRUCTIONS

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

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

Correction from 1,500ml to 3,500ml jars. Wrong but initially checked, corrected in field. Sandy S Thompson 1-27-95

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

LABORATORY SECTION: Received By | Title | Date/Time | SDG W0403

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

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

00240Se

9613451.1016

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

DATE: 01/31/95 | **LABORATORY: Quanterra**

PROJECT TITLE/NO.: 100-C Ponds/B04-088 | **NCR NO.: N/A**

SAMPLE IDENTIFICATION NUMBERS:

W0439 ~~W0386~~ 50132208 +05 32303 +05

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable) W0386

W0430 ~~W0403~~ 50151712 + 51812

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable) W0403

DESCRIPTION OF EVENT:

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

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

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

DISPOSITION OF SAMPLES:

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

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

APPROVAL SIGNATURES:

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

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

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

000016

Van Tartio Van Winde Suzi Vicki

~~0038c~~

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Appendix 5

Data Validation Supporting Documentation

RADIOCHEMICAL DATA VALIDATION CHECKLIST

VALIDATION LEVEL:	A	B	C	D	E

PROJECT: 100-DR-1 D Ponds		DATA PACKAGE: W0430-QES
VALIDATOR: RBC	LAB: QES	DATE: 30 Mar 95
CASE:		SDG: W0430-QES

ANALYSES PERFORMED

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

SAMPLES/MATRIX Soil

BOD MT4

1. Completeness . . . . . ☐ N/A

Technical verification forms present? . . . . . (Yes) No N/A

Comments:

2. Initial Calibration . . . . . ☐ N/A

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

Initial calibration acceptable? . . . . . (Yes) No N/A

Standards NIST traceable? . . . . . (Yes) No N/A

Standards Expired? . . . . . Yes (No) N/A

Comments:

A-1BC

3. Continuing Calibration . . . . . ☐ N/A

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

Comments: The checksource standard is not identified on the continuing calibration data. No qualification required.

4. Blanks . . . . . ☐ N/A

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

Comments:

5. Matrix Spikes . . . . . ☒ N/A

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

Comments:

A-2R

6. Laboratory Control Samples . . . . . ☐ N/A

LCS analyzed? . . . . . Yes No N/A
LCS recoveries acceptable? . . . . . Yes No N/A
LCS traceable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:

7. Chemical Recovery . . . . . ☒ N/A

Chemical carrier added? . . . . . Yes No N/A
Chemical recovery acceptable? . . . . . Yes No N/A
Chemical carrier traceable? . . . . . Yes No N/A
Chemical carrier expired? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A

Comments:

8. Duplicates . . . . . ☐ N/A

Duplicates Analyzed? . . . . . Yes No N/A
RPD Values Acceptable? . . . . . Yes No N/A
Transcription/Calculation Errors? . . . . . Yes No N/A

Comments:

9. Field QC Samples . . . . . ☒ N/A

Field duplicate sample(s) analyzed? . . . . . Yes No N/A
Field duplicate RPD values acceptable? . . . . . Yes No N/A
Field split sample(s) analyzed? . . . . . Yes No N/A
Field split RPD values acceptable? . . . . . Yes No N/A
Performance audit sample(s) analyzed? . . . . . Yes No N/A
Performance audit sample results acceptable? . . . . . Yes No N/A

Comments:

10. Holding Times

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

Comments:

11. Results and Detection Limits (Levels D & E) . . . . . ☐ N/A

Results reported for all required sample analyses? . . . . . Yes No N/A
Results supported in raw data? . . . . . Yes No N/A
Results Acceptable? . . . . . Yes No N/A
Transcription/Calculation errors? . . . . . Yes No N/A
MDA's meet required detection limits? . . . . . Yes No N/A
Transcription/calculation errors? . . . . . Yes No N/A

Comments: Fe-59 MDA above CRDL

~~A-4B~~

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RECORD COPY

APR 1995 RECEIVED Validation Log In

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Semi-Volatiles - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-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
B0DMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: Semi-VOA-TCL

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

If holding times are exceeded, but not by >2x the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If holding times are exceeded by >2x the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times were met for all samples.

- **Instrument Calibration and Tuning**

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

All initial and continuing calibration results were acceptable.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation and analysis. At least one acceptable method blank analysis must be conducted for every 20 samples. No contaminants should be present in the method blank. Analytical results for analytes present in any sample at <5X the concentration of that analyte found in the associated blank are qualified as non-detects and flagged "U". Common laboratory contaminants present in samples at <10x the concentration of that analyte found in the associated blank are qualified as non-detects. If a sample result is <CRQL and is <10x (or <5x for lab contaminants) the highest associated blank result, the sample result value is raised to the CRQL level and qualified as undetected "U". Tentatively identified compounds (TIC) present in the samples and blanks that are within +/-0.06 relative retention time units (RRT) of each other are qualified as undetected "U" if the sample concentration is <5x (or <10x for common laboratory contaminants) the highest blank concentration.

Due to the presence of a positive blank result, sample number B0DMT4 was flagged "U" for aldol condensate.

Due to the presence of a positive blank result, sample number B0DMT4 was flagged "U" for butylbenzylphthalate.

All other method blank results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate using six compounds and percent recoveries must be within the established laboratory quality control limits. If spike recoveries are outside control limits, detected sample results <5x the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results >5x the spike concentration require no qualification.

All matrix spike results were acceptable.

Surrogate Recovery

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

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples analyzed using SW-846 protocol, results must be within RPD limits of +/-35%. If RPD values are out of

specification and the sample concentration is <5x the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If RPD values are out of specification and the sample concentration is >5x the spike concentration, no qualification is required.

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

- **System Performance**

Internal Standards Performance

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

All internal standard recovery results were acceptable.

Compound Identification

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

All compounds were identified correctly.

- **Sample Result Verification and Detection Limits**

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

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

All sample results and reported detection limits were acceptable.

- **Completeness**

  Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Positive blank contamination was noted in one butylbenzylphthalate result and in one aldol condensate results. All results were flagged acordingly. Data flagged "J" indicate the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

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

EPA, 1991b, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Butylbenzylphthalate	U	B0DMT4	Lab Blank Contamination
Aldol Condensate (TIC)	U	B0DMT4	Lab Blank Contamination

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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

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

RBC 4-18-95

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000011

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

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

RBC - 4/18/95

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000012

9613451.1034
1B

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B0DMT4

Lab Name: QUANTERRA MO Contract: 550-56

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

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

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

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

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

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

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

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

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1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B0DMT4

Lab Name: QUANTERRA MO Contract: 550-56

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

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

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

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

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

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

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

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

(1) - Cannot be separated from Diphenylamine

9613451.1036

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B0DMT4

Lab Name: QUANTERRA MO Contract: 550-56

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

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

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

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

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

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

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

Number TICs found: 2

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

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

Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

Quanterra
Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

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

March 7, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 30, 1995
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Standalone

I. Introduction

On January 30, 1995, one (1) soil sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7444-008	B0DMT4	50151712	Soil	01/30/95

II. Analytical Results/ Methodology

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

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

Quanterra
Environmental Services

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0403 after analysis had been done, therefore matrix QC associated with SDG W0403 is included in this SDG to meet requirements.

IV. Definitions

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

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

V. Comments

Samples that arrived in St. Louis on January 30, 1995 were received at 0°C and 1 °C which is not within the recommended 4°C ± 2°C.

Samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DV1, and B0DMV2 are reported in SDG W0403 as a summary package. Sample B0DMT4 is reported in SDG W0430 as a standalone package. See ROD-B95-013.

Sample 7444-001 is included in this package only for the purpose of verifying matrix QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the VOA or BNA analyses.

Continuing Calibrations had several compounds with %Difference greater than 15, but there are no positive hits for these compounds in the sample so the analsis is valid as is.

Matrix Spike and Matrix Spike Duplicate for antimony were outside of suggested limits of 75-125 percent on sample 7444-001.

Quanterra
Environmental Services

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 3

Matrix Spike Duplicate for thallium was outside of suggested limits of 75-125 percent on sample 7444-001.

Nitrate, nitrite, and phosphate hold times expired upon receipt.

Relative Percent Difference for fluoride, chloride, phosphate, and nitrite could not be calculated due to values being below the detection limits on sample 7444-001.

Relative Percent Difference for sulfide could not be calculated due to values being below the detection limit on sample 7444-001.

Relative Percent Difference for TOX could not be calculated due to values being below the detection limit on sample 7444-001.

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:\\sqtmlo01\price$\abbydave\hanford\hanw0430.nar

1/27/55 DAS

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 13

Data Turnaround: [ ] Priorty [X] Normal

Collector: Dave St. John / Doug Bauer; WS Thompson/Amy Simpson	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: Er-80	Field Logbook No.:	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks:		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4		COOL 4					
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	P/G	P/G	P/G		
No. of Container(s)	1	1	1	1	1	1	1	1	WSt 1-27-95 ~~1~~	1	1	3	2		
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml*	500ml*	950ml		
SAMPLE ANALYSIS	ICP METALS-TAL/AA MATALS (As,Pb, Se,Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA 501518	ACTIVITY SCAN	total alpha beta GEA	total alpha beta GEA	total alpha beta GEA		

1-27-95 501517

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	501518	D					
WSt ~~BOD173~~ BODMT9	17 S	1-27-95	0910	X						X	X		X					
BODMT4 12	S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X			12	
BODMR4	13 S	1-27-95	0930	X	X	X	X	X	X	X	X	WSt 1-27-95	X		X		13	
BODMR5	14 S	1-27-95	1055	X	X	X	X	X	X	X	X	X	X		X		14	
BODMX5	15 S	1-27-95	1120	X	X	X	X	X	X	X	X	X	X		X		15	
BODMS3	16 S	1-27-95	1345	X	X	X	X	X	X	X	X		X			X	16	

CHAIN OF POSSESSION	Sign/Print Names		
Relinquished By: David St. John / David St. John ERC	Date/Time: 1/30/95 0830	Received By: ERC / Bechtel	Date/Time: 0820 1-30-95
Relinquished By: ERC / Bechtel	Date/Time: 10:40 1-30-95	Received By: Quanterra / Karen Rattenberg	Date/Time: 10:40 1-30-95
Relinquished By:	Date/Time:	Received By:	Date/Time:
Relinquished By:	Date/Time:	Received By:	Date/Time:

SPECIAL INSTRUCTIONS

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

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

Correction from 1,500ml to 3,500ml jars. wrong but initially checked, corrected in field. Sandy S Thompson 1-27-95

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
			SDG W0403

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

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9613451.1042

SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

DATE: 01/31/95

LABORATORY: Quanterra

PROJECT TITLE/NO.: 100-D Ponds/B24-099

NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

W0429 ~~W0306~~ 50132209 +05 32303 +05

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable) W0386

W0430 ~~W0403~~ 50151712 + 51812

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable) W0403

DESCRIPTION OF EVENT:

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

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

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

DISPOSITION OF SAMPLES:

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

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

APPROVAL SIGNATURES:

R. C. Smith/ [signature] 1/31/95
OSM Project Coordinator (Print/Sign Name) Date

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

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

000021

9613461 JAW

OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

RCS 1/17/95

REV. 3 . DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY:
1. EXPEDITED RESPONSE ACTION
2. ✓ TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA ✓ RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY ✓ REGULAR ✓ RADCHEM

SAMPLE MATRIX: ✓ SOIL/SEDIMENT WATER VEGETATION OILS
SLUDGE CONCRETE OTHER _____

LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
Quanterra (Main)	Not Applicable	N/A
Lockheed (Split)	Not Applicable	N/A

COMMENTS:

▸▸ Revision 1 — Changes to the EAL bottle requirements.

▸▸ Revision 2 — Change to laboratories.

▸▸ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

▸▸ Data Deliverable — Standalone

▸▸ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

9613451.1044

Appendix 5

Data Validation Supporting Documentation

GC/MS ORGANIC DATA VALIDATION CHECKLIST

LIDATION VEL:	A	B	C	D	E

OJECT: WHC DATA PACKAGE: ~~W0430~~ 3/30/95 SAF-B94-028

LIDATOR: S. Chan LAB: DATE: 3/30/95

SE: S4408 SDG: W0430

ANALYSES PERFORMED

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

MPLES/MATRIX Soil
BODMTY

DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

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

mments:

HOLDING TIMES

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

omments:

AT/SC

GC/MS ORGANIC DATA VALIDATION CHECKLIST

3. INSTRUMENT TUNING AND CALIBRATION

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

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

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

Comments:

4. BLANKS

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

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

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

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

Comments:

Butylbenzyl phthalate: 490 (in blank)
Q 11" in sample

5. ACCURACY

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

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

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

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

Comments: 3/30/95

MSD

GC/MS ORGANIC DATA VALIDATION CHECKLIST

6. PRECISION

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

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

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

Comments:

RPD= 1,2,4-Trichlorobenzene: 125 (limit - 23)
Acenaphthene: 210 (limit: 19)
No qualification required since all results are non-detected.
Qualify J only for detects - as per guidelines.

7. SYSTEM PERFORMANCE

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

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

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

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

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

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

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

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

Comments:

BLANK AND SAMPLE DATA SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
SBLK01	Butylbenzylphthalate	490	J		ug/Kg	2450	4900	B0DMT4	U
SBLK01	Aldol Condensate (TIC)	11000	J	5.3	ug/Kg	55000	110000	B0DMT4	U

000027

96/3/5 1.1048

HOLDING TIME SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1
COMMENTS: No problems. All within limits			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER

961345L.1049

000028

CALIBRATION DATA SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1
COMMENTS: All within limits.			
CALIB. TYPE: INITIAL CONTINUING		INSTRUMENT:	

CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER

9613451.1050

ACCURACY DATA SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1	
COMMENTS: No problems.				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED

000030

9513451.105

PRECISION DATA SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1
COMMENTS:			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
1,2,4-Trichlorobenzene	B0DMS4MS	B0DMS4MSD	-25	None	None
Acenaphthene	B0DMS4MS	B0DMS4MSD	-26	None	None

9613451.1052

9613451.1053

RECORD COPY

APR 1995 RECEIVED Validation Log In

Date: April 21, 1995
To: Westinghouse Hanford Company (technical representative)
From: A.T. Kearney, Inc.
Project: 100-DR-1 100-D Ponds Phase II Sampling
Subject: Pesticide/PCB - Data Package No. W0430-QES (SDG No. W0430)

INTRODUCTION

This memo presents the results of data validation on Data Package No. W0430-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
B0DMT4	01/27/95	Soil	D	See Note 1

Note 1. Requested Method: Pesticide/PCB

Data validation was conducted in accordance with the WHC statement of work (WHC 1994) and validation procedures (WHC 1993). Appendices 1 through 5 provide the following information as indicated below:

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

DATA QUALITY OBJECTIVES

- **Holding Times**

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

  If holding times are exceeded by <2x the limit, all associated sample results are qualified as estimates and flagged "J" for detects and "UJ" for non-detects. If

holding times are exceeded by >2x the limit, all associated detectable sample results are qualified as estimates and flagged "J" and all non-detects are rejected and flagged "UR".

Holding times were met for all samples.

- **Instrument Performance and Calibrations**

Initial Calibrations

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

All initial calibration results were acceptable.

Calibration Verification

The criteria for acceptable continuing calibrations requires that the calibration factors for all target compounds have a percent difference of ≤15% of the average calibration factor calculated for the associated initial calibration standard. If the percent difference for the continuing calibration is >15%, all associated results for that compound are qualified as estimates (J for detects, UJ for nondetects).

Continuing calibration results exceeded the 15% QC limit for alpha-BHC, beta-BHC, delta-BHC, 4,4-DDE, endrin, 4,4-DDD, heptachlor, 4,4-DDT, aroclor-1221, aroclor-1248 and methoxychlor in sample number B0DMT4. All associated samples were qualified as estimates and flagged "UJ".

All other calibration verification results were acceptable.

- **Blanks**

Method blank analyses are performed to determine the extent of laboratory contamination introduced through sampling, sample preparation or analysis. At least one method blank analysis must be conducted for every 20 samples. Method blanks should not contain target compounds at a concentration >CRQL. If target compounds are present, sample results <5x the blank concentration are qualified as undetected "U". If the sample result is <5x the blank concentration and <CRQL, the result is qualified as undetected and elevated to the CRQL.

All method blank results were acceptable.

- **Accuracy**

Matrix Spike

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike analyses are performed in duplicate using six compounds and must be within the established laboratory quality control limits (EPA 1991b). If spike recoveries are outside control limits, detected sample results <5x the spike concentration are qualified as estimates and flagged "J". Undetected sample results with spike recoveries outside control limits are qualified as estimates and flagged "UJ". Sample results >5x the spike concentration require no qualification.

All matrix spike results were acceptable.

Surrogate Recovery

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

All surrogate recovery results were acceptable.

- **Precision**

Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate results provide matrix-specific information on the precision of the method for specific target compound classes. Precision is expressed as the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. For soil samples analyzed using SW-846 protocol, results must be within RPD limits of $\pm$35%. If RPD values are out of specification and the sample concentration is <5x the spike concentration, all associated detected sample results are qualified as estimates and flagged "J". If

RPD values are out of specification and the sample concentration is >5x the spike concentration, no qualification is required.

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

- **System Performance**

Compound Identification

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

All compounds were identified correctly.

- **Sample Result Verification and Detection Limits**

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

All sample results and reported detection limits were acceptable.

- **Completeness**

Data Package No. W0430-QES (SDG No. W0430) was submitted for validation and verified for completeness. The completion percentage was 100%.

MAJOR DEFICIENCIES

None found.

MINOR DEFICIENCIES

Due to calibration verification results outside QC limits, eleven compounds in sample number B0DMT4 were qualified as estimates and flagged "UJ". Data flagged "J" indicate the associated concentration is an estimate, but the data are usable for decision making purposes. All other validated results are considered accurate within the standard error associated with the methods.

REFERENCES

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

EPA, 1991b, *EPA Contract Laboratory Program Statement of Work for Organics Analyses, Multi-Media, Multi-Concentration*, U.S. Environmental Protection Agency, Washington, D.C.

WHC, 1992a, *Data Validation Procedures for Chemical Analyses*, WHC-SD-EN-SPP-002, Rev. 2, Westinghouse Hanford Company, October 1993.

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Appendix 1

Glossary of Data Reporting Qualifiers

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

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

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

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

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

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

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

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

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Appendix 2

Summary of Data Qualification

DATA QUALIFICATION SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
alpha-BHC	UJ	B0DMT4	%D in Continuing Calibration Out
delta-BHC	UJ	B0DMT4	%D in Continuing Calibration Out
beta-BHC	UJ	B0DMT4	%D in Continuing Calibration Out
4,4-DDE	UJ	B0DMT4	%D in Continuing Calibration Out
Endrin	UJ	B0DMT4	%D in Continuing Calibration Out
4,4-DDD	UJ	B0DMT4	%D in Continuing Calibration Out
Heptachlor	UJ	B0DMT4	%D in Continuing Calibration Out
4,4-DDT	UJ	B0DMT4	%D in Continuing Calibration Out
Methoxychlor	UJ	B0DMT4	%D in Continuing Calibration Out
Aroclor-1221	UJ	B0DMT4	%D in Continuing Calibration Out
Aroclor-1248	UJ	B0DMT4	%D in Continuing Calibration Out

Appendix 3

Qualified Data Summary and Annotated Laboratory Reports

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

Project: WESTINGHOUSE–HANFORD																							
Laboratory: QUANTERRA																							
Case:	SDG: W0430																						
Sample Number		B0DMT4																					
Location		Test Pit #2																					
Remarks																							
Sample Date		01/27/95																					
Extraction Date		02/03/95																					
Analysis Date		02/08/95																					
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha–BHC	1.7	1.1	UJ																				
beta–BHC	1.7	2.1	UJ																				
delta–BHC	1.7	3.2	UJ																				
gamma–BHC (Lindane)	1.7	1.4	U																				
Heptachlor	1.7	1.1	UJ																				
Aldrin	1.7	1.4	U																				
Heptachlor epoxide	1.7	30	U																				
Endosulfan I	1.7	5.0	U																				
Dieldrin	3.3	0.71	U																				
4,4'–DDE	3.3	1.4	UJ																				
Endrin	3.3	2.1	UJ																				
Endosulfan II	3.3	1.4	U																				
4,4'–DDD	3.3	3.9	UJ																				
Endosulfan sulfate	3.3	24	U																				
4,4'–DDT	3.3	4.3	UJ																				
Methoxychlor	17.0	63	UJ																				
Endrin Ketone	3.3	8.2	U																				
Tech. Chlordane	1.7	5.0	U																				
Toxaphene	170.0	85	U																				
Arochlor–1221	33.0	36	UJ																				
Arochlor–1232	67.0	36	U																				
Arochlor–1242/1016	33.0	24	U																				
Arochlor–1248	33.0	36	UJ																				
Arochlor–1254	33.0	36	U																				
Arochlor–1260	33.0	36	U																				

RBC 4/18/95

000011

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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BODMT4

Lab Name: QUANTERRA,MO Contract: 550-56

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

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

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

Level: (low/med) LOW Date Sampled: 01-27-95

% Moisture: not dec. 6 dec. _____ Date Extracted: 02-03-95

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 02-08-95

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

CAS NO.	Compound	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	1.1	U J
319-85-7	beta-BHC	2.1	U J
319-86-8	delta-BHC	3.2	U J
58-89-9	gamma-BHC (Lindane)	1.4	U
76-44-8	Heptachlor	1.1	U J
309-00-2	Aldrin	1.4	U
1024-57-3	Heptachlor epoxide	30	U
959-98-8	Endosulfan I	5.0	U
60-57-1	Dieldrin	0.71	U
72-55-9	4,4'-DDE	1.4	U J
72-20-8	Endrin	2.1	U J
33213-65-9	Endosulfan II	1.4	U
72-54-8	4,4'-DDD	3.9	U J
1031-07-8	Endosulfan sulfate	24	U
50-29-3	4,4'-DDT	4.3	U J
72-43-5	Methoxychlor	63	U J
7421-93-4	Endrin Aldehyde	8.2	U
57-74-9	Chlordane (technical)	5.0	U
8001-35-2	Toxaphene	85	U
11104-28-2	Aroclor-1221	36	U J
11141-16-5	Aroclor-1232	36	U
53469-21-9/12674-11-2	Arochlor-1242/1016	24	U
12672-29-6	Aroclor-1248	36	U J
11097-69-1	Aroclor-1254	36	U
11096-82-5	Aroclor-1260	36	U

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

FORM I PEST

3/30/95 SC

~~A0630~~

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Appendix 4

Laboratory Narrative and Chain-of-Custody Documentation

9613451.1066

Quanterra
Environmental Services

Quanterra Incorporated
13715 Rider Trail North
Earth City, Missouri 63045

314 298-8566 Telephone
314 298-8757 Fax

CERTIFICATE OF ANALYSIS

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

March 7, 1995

Attention: Joan Kessner

Project number	:	550.56
Date Received by Lab	:	January 30, 1995
Number of Samples	:	One (1)
Sample Type	:	Soil
SDG Number	:	W0430
Data Deliverable	:	Standalone

I. Introduction

On January 30, 1995, one (1) soil sample was received by Quanterra, Richland and transferred to Quanterra, St. Louis for chemical analyses. Upon receipt, the sample was given the following laboratory ID number to correspond with the specific client ID:

St Louis ID	WHC ID	Richland ID	Matrix	Date of Receipt
7444-008	B0DMT4	50151712	Soil	01/30/95

II. Analytical Results/ Methodology

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

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

Quanterra
Environmental Services

III. Quality Control

A Laboratory Control Sample and Method Blank were analyzed with each preparation batch. This SDG was separated from SDG W0403 after analysis had been done, therefore matrix QC associated with SDG W0403 is included in this SDG to meet requirements.

IV. Definitions

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

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

V. Comments

Samples that arrived in St. Louis on January 30, 1995 were received at 0°C and 1 °C which is not within the recommended 4°C ± 2°C.

Samples B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DV1, and B0DMV2 are reported in SDG W0403 as a summary package. Sample B0DMT4 is reported in SDG W0430 as a standalone package. See ROD-B95-013.

Sample 7444-001 is included in this package only for the purpose of verifying matrix QC and should not be considered as part of this SDG.

There are no comments or nonconformances associated with the VOA or BNA analyses.

Continuing Calibrations had several compounds with %Difference greater than 15, but there are no positive hits for these compounds in the sample so the analsis is valid as is.

Matrix Spike and Matrix Spike Duplicate for antimony were outside of suggested limits of 75-125 percent on sample 7444-001.

Quanterra
Environmental Services

Bechtel Hanford Incorporated
March 7, 1995
Project Number: 550.56
SDG: W0430
Page 3

Matrix Spike Duplicate for thallium was outside of suggested limits of 75-125 percent on sample 7444-001.

Nitrate, nitrite, and phosphate hold times expired upon receipt.

Relative Percent Difference for fluoride, chloride, phosphate, and nitrite could not be calculated due to values being below the detection limits on sample 7444-001.

Relative Percent Difference for sulfide could not be calculated due to values being below the detection limit on sample 7444-001.

Relative Percent Difference for TOX could not be calculated due to values being below the detection limit on sample 7444-001.

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:\\sqtmlo01\price$\abbydave\hanford\hanw0430.nar

1/27/95 DAS

Westinghouse Hanford Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Page 1 of 13

Date Turnaround: [ ] Priorty [X] Normal

Collector: Dave St. John / Doug Bauer; WS Thompson/Amy Simpson	Company Contact: RC SMITH/MT STANKOVICH	Telephone No.: (509)372-2537/(509)376-2493
Project Designation: 100-D PONDS PHASE II SAMPLING	Sampling Location: 100-D	SAF No.: B94-098
Ice Chest No.: Er-80	Field Logbook No.	Method of Shipment: HAND DELIVER
Shipped To: QUANTERRA	Offsite Property No.: N/A	Bill of Lading/Air Bill No.: N/A
Possible Sample Hazards/Remarks		
Special Handling and/or Storage: COOL TO 4 DEGREES CENTIGRADE		

Preservative	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4	COOL 4		COOL 4					
Type of Container	aG	Gs	aG	aG	aG	aGs	aG	aG	aG	P/G	P/G	P/G	P/G		
No. of Container(s)	1	1	1	1	1	1	1	1	WST 1-27-95 ~~1~~ 1	1	1	3	2		
Volume	125ml	125ml	125ml	125ml	40ml	40ml	125ml	125ml	500ml*	20ml	950ml*	500ml*	950ml		
SAMPLE ANALYSIS	ICP METALS-TAL/AA MATALS (As,Pb, Se,Tl) A	VOA-TCL B	SEMI-VOA-TCL C	PCB/PEST D	SULFIDE E	TOX F	ANIONS-IC(F, Cl, SO4, PO4, NO2, NO3) G	NO2-NO3 H	TOTAL ALPHA/BETA, GEA 501518	ACTIVITY SCAN	total alpha beta GEA	total alpha beta GEA	total alpha beta GEA		

1-27-95 WST 501517

Sample No.	Matrix*	Date Sampled	Time Sampled	A	B	C	D	E	F	G	H	501518	ACTIVITY SCAN	total alpha beta GEA	total alpha beta GEA	total alpha beta GEA	
~~300173~~ BODMT9	17 S	1-27-95	0910	X						X	X		X				
BODMT4	12 S	1-27-95	0930	X	X	X	X	X	X	X	X	X	X	X			12
BODMR4	13 S	1-27-95	0930	X	X	X	X	X	X	X	X	WST 1-27-95 X	X		X		13
BODMR5	14 S	1-27-95	1055	X	X	X	X	X	X	X	X	X	X		X		14
BODMX5	15 S	1-27-95	1120	X	X	X	X	X	X	X	X	X	WST 1-27-95 X		X		15
BODMS3	16 S	1-27-95	1345	X	X	X	X	X	X	X	X		X			X	16

CHAIN OF POSSESSION	Sign/Print Names	Date/Time	Received By	Date/Time
Relinquished By	David St. John ERC	1/30/95 0830	Received By: ERC Bakthen	0820 1-30-95
Relinquished By	ERC Bakthen	1-30-95 10:40	Received By: Quantera Karen Hattenberg	10:40 1-30-95
Relinquished By		Date/Time	Received By	Date/Time
Relinquished By		Date/Time	Received By	Date/Time

SPECIAL INSTRUCTIONS

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

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

Correction from 1,500ml to 3,500ml jars. wrong but initially checked, corrected in field. Stanley J Thompson 1-27-95

Matrix*

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

LABORATORY SECTION	Received By	Title	Date/Time
			SDG W0403

FINAL SAMPLE DISPOSITION	Disposal Method	Disposed By	Date/Time

DISTRIBUTION: Original- Sample Yellow - Sampler

BC-6000-828 (12/92)

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SAMPLE AND DATA MANAGEMENT

RECORD OF DISPOSITION

ROD-B95-013
Record of Disposition No.

DATE: 01/31/95	LABORATORY: Quanterra
PROJECT TITLE/NO.: 100-D Ponds/B04-099	NCR NO.: N/A

SAMPLE IDENTIFICATION NUMBERS:

W0439 ~~W0306~~ 50132203+05 32303+05

1) B0DMT2, B0DMT3 (1 SDG, standalone deliverable); B0DMT6, B0DMS9, B0DMR2, B0DMR3, B0DMT5 (1 SDG, summary deliverable) W0386

W0430 ~~W0403~~ 50151712 + 51812

2) B0DMT4 (1 SDG, standalone deliverable); B0DMR4, B0DMR9, B0DMS6, B0DMT1, B0DMR5, B0DMS0, B0DMS7, B0DMR6, B0DMS3, B0DMS8, B0DMT7, B0DMR7, B0DMS4, B0DMT0, B0DMT9, B0SMX5, B0DMV0, B0DMV1, B0DMV2 (1 SDG, summary deliverable) W0403

DESCRIPTION OF EVENT:

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

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

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

DISPOSITION OF SAMPLES:

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

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

APPROVAL SIGNATURES:

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

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

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

OFFICE OF SAMPLE MANAGEMENT
SAMPLING AUTHORIZATION FORM
SAF # B94-098

RCS 1/17/95

REV. 3 . DATE: 01/17/95

PROJECT NUMBER B94-098 PROJECT TITLE 100-D Ponds Phase II Sampling

OSM PROJECT COORDINATOR R. C. Smith OPERABLE UNIT/TSD 100-DR-1

CUSTOMER NAME M. T. Stankovich PHONE # 376-2493 MSIN H6-04

ORGANIZATION/CODE CE021 CHARGE CODE PV3AA

SAMPLING DATE 01/95 NUMBER OF SAMPLES ~28 SAMPLING LOCATION 100-DR-1

SAMPLE PRIORITY:
1. EXPEDITED RESPONSE ACTION
2. ✓ TPA RANKING _____
3. NON-TPA RANKING _____

ANALYTICAL PROTOCOLS: CERCLA ✓ RCRA OTHER (specify) _____

DATA TURNAROUND REQUIREMENTS: PRIORITY ✓ REGULAR ✓ RADCHEM

SAMPLE MATRIX: ✓ SOIL/SEDIMENT WATER VEGETATION OILS
SLUDGE CONCRETE OTHER _____

LABORATORY SERVICES ✓ ON-SITE ✓ OFF-SITE

LABORATORY	LABORATORY CONTACT	TELEPHONE
Quanterra (Main)	Not Applicable	N/A
Lockheed (Split)	Not Applicable	N/A

COMMENTS:

▸▸ Revision 1 — Changes to the EAL bottle requirements.

▸▸ Revision 2 — Change to laboratories.

▸▸ Revision 3 — Change to volatile and TOX bottle types.

Please note the following on the Chain of Custody —

▸▸ Data Deliverable — Standalone

▸▸ Laboratory analysis for phosphate, nitrate, and nitrite is requested for information only. The ERC Contractor acknowledges the 48-hour holding time will not be met.

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Appendix 5

Data Validation Supporting Documentation

PESTICIDE/PCB DATA VALIDATION CHECKLIST

ALIDATION EVEL:	A	B	C	D	E

ROJECT: WHC | DATA PACKAGE: SAF-B94-098

ALIDATOR: S. Chari | LAB: | DATE: 3/30/95

ASE: | SDG: W00430

ANALYSES PERFORMED

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

AMPLES/MATRIX SOIL
BODMT4

DATA PACKAGE COMPLETENESS AND CASE NARRATIVE

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

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

ments:

HOLDING TIMES

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

ments:

INSTRUMENT PERFORMANCE AND CALIBRATIONS

INSTRUMENT PERFORMANCE (METHOD 8080 AND 8081)

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

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

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

A-5 BL

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 up table for qualifiers

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

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

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

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

PC cleanup performed? . . . . . Yes No N/A

e GPC calibration check acceptable? . . . . . Yes No N/A

lorisil cleanup performed? . . . . . Yes No N/A

e Florisil performance check acceptable? . . . . . Yes No N/A

nts:_____

LANKS

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

aboratory blank results acceptable? . . . . . Yes No N/A

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

ield/trip blank results acceptable? . . . . . Yes No N/A

nts:_____

CCURACY

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

urrogate recoveries acceptable? . . . . . Yes No N/A

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

IS/MSD results acceptable? . . . . . Yes No N/A

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

CS results acceptable? . . . . . Yes No N/A

ents:_____

PESTICIDE/PCB DATA VALIDATION CHECKLIST

6. PRECISION

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

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

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

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

Comments:

7. SYSTEM PERFORMANCE

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

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

Comments:

8. COMPOUND IDENTIFICATION AND QUANTITATION

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

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

Comments:

9. REPORTED RESULTS AND QUANTITATION LIMITS

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

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

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

Comments:

A-8 BC

CALIBRATION DATA SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1		
COMMENTS: No problems.					
CALIB. TYPE:	INITIAL CONTINUING	INSTRUMENT:			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
2/7/95	alpha-BHC		32%	B0DMT4	UJ
2/7/95	delta-BHC		30	B0DMT4	UJ
2/7/95	beta-BHC		47	B0DMT4	UJ
2/7/95	4,4-DDE		33	B0DMT4	UJ
2/7/95	Endrin		35	B0DMT4	UJ
2/7/95	4,4-DDD		29	B0DMT4	UJ
2/7/95	Heptachlor		17	B0DMT4	UJ
2/7/95	4,4-DDT		17	B0DMT4	UJ
2/7/95	Methoxychlor		24	B0DMT4	UJ
2/7/95	Aroclor-1221		24	B0DMT4	UJ
2/7/95	Aroclor-1248		19	B0DMT4	UJ

000023

96 1345 1077

HOLDING TIME SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1
COMMENTS: No problems. All within limits			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER

96151*1078

BLANK AND SAMPLE DATA SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1
COMMENTS: No problems.			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER

961345I.1079

ACCURACY DATA SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1	
COMMENTS: No problems.				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED

0001345 1 1080

PRECISION DATA SUMMARY

SDG: W0430	REVIEWER: SC	DATE: 3/30/95	PAGE 1 OF 1
COMMENTS: No problems.			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER