START 9715515.0002

B01DH7-TMA-066

0046142 0001

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

JAN 1992 RECEIVED OSM DMO

GENERAL CHEMISTRY
CASE NO. 12-015
(TMA/ARLI Work Order # A1-12-015)

ORGANICS
CASE NO. 12-015
(TMA/ARLI Work Order # A1-12-015)

General Chemistry and Organics results are presented for the following WHC WATER samples(s):

B01DH7
B01DJ0
B01DJ3
B01DL7
B01DN8
B01DY5
B01DY7
B01DY9
B01DZ1

DEC 1996 RECEIVED EDMC

Norcal Work Order # N1-12-034

Thermo Analytical Inc.
160 Taylor Street
Monrovia, Ca. 91016
818-357-3247

Westinghouse Hanford Company

Hanford Operations and Engineering Contractor for the US Department of Energy

P.O. Box 1970 Richland, Wa. 99352

NONCONFORMANCE REPORT

Page 1 of ____

No. B 06124

MFR/ORG: WHC

ITEM/MATERIAL NAME: Envir. Sample

PART NO.: N/A

DRAWING/SPEC. NO.: N/A

REV.: N/A

PROGRAM/PROJECT: 300-FF-5

P.O./W.O. NO.: 92-097

UNUSUAL OCCURRENCE REPORT REQUIRED: ☐ YES ☒ NO

SYSTEM/END USE: N/A

DATE: 4-22-92

DESCRIPTION OF NONCONFORMANCE: ROD-92-00041 & 42

01F36, 39, & 42 SAMPLES

01F01, 05, 07, 09, 13, 15, 17 & 19 - B01DQ1, 4 & 7

01DR0, 3, 6 & 9 - B01D~~23~~ 25, 52 ~~55~~ 52 - B01DY5, 7 & 9

01DZ1 - B01DK8 · B01DZ7, B01FN4*, B01DP8*, B01P31*

QC's: SAR's listed above sample as needing a isotopic analysis, this was incorrect. Radium isotopic analysis was needed and later requested.

3. REQUIREMENT VIOLATED: Soil & Sediment Sampling

DOCUMENT: WHC-CM-7-7

REV: 3

ZONE/PARA: 5.2

* Added 5/29/92 per COC

ORIGINATOR: [signature] ORGANIZATION: 12500 DATE: 4-22-92

ASME CODE ITEM(s): ☒ NO ☐ YES. NOTIFY AUTHORIZED INSPECTOR.

WHC QAR: N/A

CAUSE OF NONCONFORMANCE: ☐ PROCEDURES ☒ PERSONNEL ☐ MATERIALS ☐ EQUIPMENT ☐ OTHERS

REMARKS:

S= D3 / SW-01 / PN-003

6. CORRECTIVE ACTION TO ELIMINATE CAUSE: Better QC when filling out SARs

INITIATION DATE: ____ SERIAL NO.: ____

RESPONSIBLE ORG. REP.: OSM & BRUCE FORD TITLE: ____ DATE: ____

RECOMMENDED DISPOSITION: ☒ ACCEPT ☐ REJECT ☐ REPAIR ☐ REWORK ☒ OTHER

DISPOSITION JUSTIFICATION AND INSTRUCTIONS: Analysis was continued - OSM to direct labs to change analysis if this hasn't been done.

8. ADDITIONAL REVIEWS REQUIRED (WHC ONLY): ☐ YES ☒ NO

IF YES, IDENTIFY:

SUPPLIER ENG.: ____ SUPPLIER QA: ____

DISPOSITION APPROVAL (WHC ONLY): ☒ APPROVED ☐ DISAPPROVED ☐ OTHER (SEE CONTINUATION SHEET)

COGNIZANT ENGINEER: LC Hulstrom [signature] DATE: 7/30/92

COGNIZANT QA ENGINEER: JR McCallum [signature] DATE: 7/30/92

AUTHORIZED INSPECTOR REVIEW: ____ DATE: ____

11. ADDITIONAL APPROVALS

NAME	TITLE	DATE	NAME	TITLE	DATE
N/A					

DISPOSITION ACTION COMPLETE

NAME: N/A DATE: ____ QTY. ACCEPT: ____ QTY. REJ.: ____

FOLLOW ON NCR

QA LOG NO.: QA-92-077

The issuance and acceptance of this request in no way limits or affects the warranty provisions of the order. This request shall not establish a precedent or obligation to accept similar conditions in the future.

FOLLOW-UP LEVEL: A ☐ B ☐ C ☐

110-104 (6-87)

☆ U.S. GPO 1990-794-830

9713515.0004

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NONCONFORMANCE REPORT

Page 1 of 1

No. B 07996

1. MFR/ORG: WHC

ITEM/MATERIAL NAME: Environmental Sample
PART NO.: N/A
DRAWING/SPEC. NO.: N/A
REV.: N/A
PROGRAM/PROJECT: 300-FF-5
P.O./W.O. NO.: N/A
UNUSUAL OCCURRENCE REPORT REQUIRED: ☐ YES ☒ NO
SYSTEM/END USE: N/A
DATE: 5/15/92

2. DESCRIPTION OF NONCONFORMANCE

Samples B01DV1, B01DV2, B01DV3 & B01DV0 were received at lab (HEHF), but no data or NCR has been returned.

3. REQUIREMENT VIOLATED

	DOCUMENT	REV	ZONE/PAR.
Records Management	WHC-CM-7-7	2	EII 1.6
Chain of Custody	WHC-CM-7-7	4	EII 5.1

Michael A. O'Farrah — ORIGINATOR
81222 — ORGANIZATION
5/15/92 — DATE

4. ASME CODE ITEM(s): ☒ NO ☐ YES. NOTIFY AUTHORIZED INSPECTOR.

WHC QAR: N/A

5. CAUSE OF NONCONFORMANCE

☐ PROCEDURES ☒ PERSONNEL ☐ MATERIALS
☐ EQUIPMENT ☐ OTHERS

REMARKS:

SW-01 / PN-006

6. CORRECTIVE ACTION TO ELIMINATE CAUSE

Better tracking of Samples.

INITIATION DATE
SERIAL NO.
Karl Pool — RESPONSIBLE ORG. REP.
TITLE
5/15/92 — DATE

7. RECOMMENDED DISPOSITION: ☐ ACCEPT ☐ REJECT ☐ REPAIR ☐ REWORK ☒ OTHER

8A. DISPOSITION JUSTIFICATION AND INSTRUCTIONS

Chain of Custodies show samples were received at lab. OSM to track down samples and determine why no data has been returned. – When these wells were sampled, a full suite sample was taken along with a coliform sample which was given a separate sample#. The coliform sample bottles were given the parent or full suite sample#. HEHF reported the coliform value under the parent #. B01DV1 reported under B01BD1, B01DV2 under D01DZ1, & B01DV3 under B01DV7.

8B. SUPPLIER ENG.
SUPPLIER QA

9. ADDITIONAL REVIEWS REQUIRED (WHC ONLY) ☐ YES ☒ NO
IF YES, IDENTIFY:

10. DISPOSITION APPROVAL (WHC ONLY)

☒ APPROVED ☐ DISAPPROVED
☐ OTHER (SEE CONTINUATION SHEET)

L A Hulstrom — COGNIZANT ENGINEER — DATE 1/25/93
J E McCallum — COGNIZANT QA ENGINEER — DATE 1/25/93
N/A — AUTHORIZED INSPECTOR REVIEW — DATE

11. ADDITIONAL APPROVALS

NAME	TITLE	DATE	NAME	TITLE	DATE
N/A					

12. DISPOSITION ACTION COMPLETE

J E McCallum — NAME — DATE 2/18/93
QTY. ACCEPT 4
QTY. REJ. 0
FOLLOW ON NC

QA LOG NO. EQA-92-069

The issuance and acceptance of this request in no way limits or affects the warranty provisions of the order. This request shall not establish a precedent or obligation to accept similar conditions in the future.

FOLLOW-UP LEVEL A B C

9213515.0005

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Hanford Operations and Engineering Contractor for the US Department of Energy
P.O. Box 1970 Richland, Wa. 99352

NONCONFORMANCE REPORT

Page 1 of 1

No. B 08480

1. MFR/ORG: WHC/Roy F Weston Inc

ITEM/MATERIAL NAME: Environmental Sample
DRAWING/SPEC. NO.: N/A
PROGRAM/PROJECT: 300-FF-5
SYSTEM/END USE: N/A

PART NO.: N/A
REV.: N/A
P.O./W.O. NO.: N/A
DATE: 5/20/92

UNUSUAL OCCURRENCE REPORT REQUIRED: ☐ YES ☒ NO

2. DESCRIPTION OF NONCONFORMANCE

Data transmittal #376 from OSM to EDMC lists TOC as the only constituent in data package 9112L696. The cover sheet for this data package lists TOX and Wet Chemistry as the constituents analyzed for. Review of the data package showed it actually contained TOC and TOX.

3. REQUIREMENT VIOLATED

	DOCUMENT	REV	ZONE/PAR
Records Management	WHC-CM-7-7	2	EII 1.6
Soil & Sediment Sampling	WHC-CM-7-7	3	EII 5.2

Michael A. Frank — ORIGINATOR
81222 — ORGANIZATION
5/20/92 — DATE

4. ASME CODE ITEM(s): ☒ NO ☐ YES. NOTIFY AUTHORIZED INSPECTOR.

WHC QAR: N/A

5. CAUSE OF NONCONFORMANCE

☐ PROCEDURES ☒ PERSONNEL ☐ MATERIALS
☐ EQUIPMENT ☐ OTHERS

REMARKS:

PIS= D3 PN-003 SW-01

6. CORRECTIVE ACTION TO ELIMINATE CAUSE

Better quality control during preparation of transmittals to EDMC.

INITIATION DATE: SERIAL NO.:

Joan Kessner OSM
RESPONSIBLE ORG. REP. TITLE DATE

7. RECOMMENDED DISPOSITION: ☒ ACCEPT ☐ REJECT ☐ REPAIR ☐ REWORK ☒ OTHER

8A. DISPOSITION JUSTIFICATION AND INSTRUCTIONS

OSM to correct transmittal forms at EDMC.

Verified Corrected at EDMC on 8/20/92

8B. SUPPLIER ENG.: SUPPLIER QA:

9. ADDITIONAL REVIEWS REQUIRED (WHC ONLY): ☐ YES ☒ NO
IF YES, IDENTIFY:

10. DISPOSITION APPROVAL (WHC ONLY)

☒ APPROVED ☐ DISAPPROVED
☐ OTHER (SEE CONTINUATION SHEET)

LC Hulstrom LC Hulstrom 8/20/92
COGNIZANT ENGINEER DATE

JR McCallum JR McCallum 8/20/92
COGNIZANT QA ENGINEER DATE

AUTHORIZED INSPECTOR REVIEW DATE

11. ADDITIONAL APPROVALS

NAME	TITLE	DATE	NAME	TITLE	DATE
N/A					

12. DISPOSITION ACTION COMPLETE

N/A
NAME DATE

QTY. ACCEPT: QTY. REJ.:

FOLLOW ON NC

QA LOG NO.: EQA-92-075

The issuance and acceptance of this request in no way limits or affects the warranty provisions of the order. This request shall not establish a precedent or obligation to accept similar conditions in the future.

FOLLOW-UP LEVEL: A B C

A-7310-104 (6-87)

9713515.0006

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P.O. Box 1970 Richland, Wa. 99352

NONCONFORMANCE REPORT

Page 1 of 1

No. B 03488

1. MFR/ORG: WHC

ITEM/MATERIAL NAME: Environmental Sample
PART NO.: N/A
DRAWING/SPEC. NO.: N/A
REV.: N/A
PROGRAM/PROJECT: 300-FF-5
P.O./W.O. NO.: N/A
UNUSUAL OCCURRENCE REPORT REQUIRED: ☐ YES ☒ NO
SYSTEM/END USE: N/A
DATE: 5/29/92

2. DESCRIPTION OF NONCONFORMANCE

HEHF letter from DA Sams to D Edwards, "300-FF-5 groundwater Coliform Analysis", C017629 dated Feb 10, 1992, states samples 801DY5, 801DY7 & 801DZ1 were analyzed for coliform. The Chain of Custodys states these samples were sent to TMA for chemical testing.

3. REQUIREMENT VIOLATED

DOCUMENT	REV	ZONE/PARA
Sample Identification number	WHC-7-7	0	5.10

Michael A. Fuca — ORIGINATOR
81222 — ORGANIZATION
5/29/92 — DATE

4. ASME CODE ITEM(s) ☒ NO ☐ YES. NOTIFY AUTHORIZED INSPECTOR.

WHC QAR: N/A

5. CAUSE OF NONCONFORMANCE
☐ PROCEDURES ☒ PERSONNEL ☐ MATERIALS
☐ EQUIPMENT ☐ OTHERS

REMARKS:

SW-01 / PN-006

6. CORRECTIVE ACTION TO ELIMINATE CAUSE

Better quality control when assigning sample numbers.

INITIATION DATE: _____ SERIAL NO.: _____

Jan Kessner — RESPONSIBLE ORG. REP.
OSM — TITLE
MGR — DATE

7. RECOMMENDED DISPOSITION ☐ ACCEPT ☐ REJECT ☐ REPAIR ☐ REWORK ☒ OTHER

8A. DISPOSITION JUSTIFICATION AND INSTRUCTIONS

Duplicate sample assignments probable. Samtrack has these samples listed with the suffix "a" on the end. OSM to determine true nature of the samples. The sample numbers listed are the parent or fuel scintc number for Coliform samples per OSM.

9. ADDITIONAL REVIEWS REQUIRED (WHC ONLY) ☐ YES ☒ NO
IF YES, IDENTIFY:

8B. SUPPLIER ENG. _____ SUPPLIER QA _____

10. DISPOSITION APPROVAL (WHC ONLY)
☒ APPROVED ☐ DISAPPROVED
☐ OTHER (SEE CONTINUATION SHEET)

LC Hulstrom / LC Hulstrom — COGNIZANT ENGINEER — DATE 1/25/93
JR McCallum / JR McCallum — COGNIZANT QA ENGINEER — DATE 1/25/93
N/A — AUTHORIZED INSPECTOR REVIEW — DATE

11. ADDITIONAL APPROVALS

NAME	TITLE	DATE	NAME	TITLE	DATE
N/A					

12. DISPOSITION ACTION COMPLETE

JR McCallum — NAME
2/18/93 — DATE
QTY. ACCEPT: 3
QTY. REJ.: 0
FOLLOW ON

QA LOG NO.: EQA-92-087

The issuance and acceptance of this request in no way limits or affects the warranty provisions of the order. This request shall not establish a precedent or obligation to accept similar conditions in the future.

FOLLOW-UP LEVEL

9713515.0007

Westinghouse Hanford Company

NONCONFORMANCE REPORT

1. Page 1 of 4

2. Preprinted No. 050510

QA Log No. EGA-92-118

3. P. O., W. O., or Job Control No.	4. System/End Use	5. Item/Material	6. Dwg./Spec./Other No.	7. Rev.
n/A	RI/FS	Water Samples	N/A ~~CCIF39, CCIF36, CCIF42 (Samples)~~ JWD 12/7/92	0

8. Program/Project/Other	9. Safety Class	10. ASME Code Items
300-FF-5 / 91-097	4 ~~IV~~	☐ Yes ☒ No (If yes, notify authorized inspector)

11. Supplier Name/Address	12. Notification of Potential Occurence Required
Thermo Analytical	☐ Yes ☒ No

13. Code: Lot/Heat/Serial	14. Lot Size	15. Sample	16. Qty. Acc.	17. Inspection Criteria
n/A	1	1	0	☐ Dwg. ☐ Spec. ☐ Insp. Plan ☒ Other EPA Method 300.0

18. Item	19. Description of Nonconformance (list serial no. where applicable)	22. Disposition, Justification, and Instructions
1.	A zinc acetate/sodium hydroxide preservation was incorrectly requested on the Sample Authorization Form (SAF) for all 4th quarter 1991 groundwater samples analyzed for anions. This preservative was subsequently added to the sample containers analyzed for anions. The addition of the preservative will result in false positives for fluoride. (Refer to ROD-92-C0183 and ROD-92-184)	All fluoride results associated with the 4th quarter 1991 groundwater sampling are unreliable.

20. Originator's Signature: JC McClanahan / LC McClanahan — Date 11/23/92 (1/5/93)

23. Design Document Change Required? ☐ Yes, Doc. No. ____ ☑ No

21. Cognizant QA Manager's Signature — Date 1-5-93

24. Corrective Action Required? ☐ Yes, No. ____ ☑ No

Disp. App.	25. Cognizant Engineer	Date	26. Technical Rep.	Date	Signature/Org.	Date
	LC Hulstrom	1/13/93	N/A			
	QA Engineer	Date	Signature/Org.	Date	Signature/Org.	Date
	JR McCallum	1/15/93				

Close — 27. Accept ✓ (1) Reject 0 Follow on NCR N/A — QA/C Personnel — Date 1/15/93

A-7310-104 (10/91)

9713515.0008

Westinghouse Hanford Company

NONCONFORMANCE REPORT

1. Page 1 of 1

2. Preprinted No. 051177

QA Log No. EQA-92-105

3. P. O., W. O., or Job Control No.	4. System/End Use	5. Item/Material	6. Dwg./Spec./Other No.	7. Rev.
N/A	N/A	Environmental data	N/A	N/A

8. Program/Project/Other	9. Safety Class	10. ASME Code Items
300-FF-5 O.U.	N/A	☐ Yes ☒ No (If yes, notify authorized inspector)

11. Supplier Name/Address	12. Notification of Potential Occurence Required
Thermo analytical Labs	☐ Yes ☒ No

13. Code: Lot/Heat/Serial	14. Lot Size	15. Sample	16. Qty. Acc.	17. Inspection Criteria
N/A	N/A	N/A	N/A	☐ Dwg. ☐ Spec. ☐ Insp. Plan ☒ Other N/A USEPA CLP SOW Rev 10/22/92 2188 *

18. Item	19. Description of Nonconformance (list serial no. where applicable)	22. Disposition, Justification, and Instructions
	TMA labs has been issuing data packages that are incompatible with the HEIS format. The "GC column" field in the Summary reports (electronic and hardcopy) are supposed to have either "Pack" or "Cap", for Packed and Capillary, respectively. Several samples have "Wide" listed in this column. "Wide" does not match the laboratory contract and is preventing the data from being loaded onto HEIS. The SOW for CLP analysis calls for either "Cap" or "Pack" in this field.	After consulting TMA Bill Strohben (QSM) concluded that "Wide" stands for "Wide bore capillary". The lab recommends changing the "Wide" to "Cap" to correct this problem. TMA will send a letter confirming this. A copy of TMA's letter and this NCR shall be kept in the 300-FF-5 project files. The HEIS database shall change "Wide" to "Cap" for all 300-FF-5 samples. TMA will enter only "Cap" or "Pack" in this field from now on.
		* Pg H-7 of the USEPA CLP SOW for Organic Analysis Multi-Media Multi-Concentration Rev. 2/88 is the requirement which has been violated.

20. Originator's Signature	Date	23. Design Document Change Required?
Michael A. Frank	10/13/92	☐ Yes, Doc. No. _____ ☒ No
21. Cognizant QA Manager's Signature	**Date**	**24. Corrective Action Required?**
[signature]	10/26/92	☐ Yes, No. _____ ☐ No

Disp. App.	25. Cognizant Engineer	Date	26. Technical Rep.	Date	Signature/Org.	Date
	L.C. Hulstrom	12/9/92				
	QA Engineer	Date	Signature/Org.	Date	Signature/Org.	Date
	J.E. McCallum	12/9/92				

Close	27.
	Accept ✓ Reject _____ Follow on NCR _____ [signature] QA/C Personnel 12/18/92 Date

A-7310-104 (10/91)

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(415) 235-2633 Fax No. (415) 235 0438

October 13, 1992

Bill Strohben
Westinghouse Hanford Company
Office of Sample Management
2355 Stevens Drive
Richland, WA, 99352

Re: WHC Contract # MBH-SVV-069262. Clarification and change to VOA forms.

Dear Bill:

As per your facsimile of October 12, 1992, I am writing to confirm that the designation "WIDE" on the VOA forms indicated the use of a wide bore capillary column in the analysis. Beginning with samples analyzed after September 3, 1992, this field on the VOA form uses the designation "CAP" instead of "WIDE".

Sincerely,

Daniel H. Stuermer, Ph.D.
Technical Director, TMA

RECORD OF DISPOSITION ROD-91-00017

DATE: 12/10/91 | LABORATORY: TMA | 300-FF-5

SAMPLE IDENTIFICATION NUMBERS (ROD) 91-97

B01D45
B01D47
B01D49
B01D21

DISPOSITION OF SAMPLES

☐ CANCELLED (REASON) _____

☐ DAMAGED SAMPLE CONTAINER. ANALYSIS CANCELLED

☐ BROKEN GLASS CONTAMINATING SAMPLE. ANALYSIS CANCELLED

☒ OTHER CHAIN OF CUSTODY STATES Pa-235. THIS IS ~~NOT~~ LKE 12/10/91 SUPPOSED TO READ Uranium-235. Correction was given by Dusty Butcher.

APPROVED David L. Edwards 12/10/91
PROJECT COORDINATOR DATE

LC Hulstrom 12/13/91
TECHNICAL REPRESENTATIVE DATE

9213515.0010

RECORD OF DISPOSITION

RCD-91-00020

DATE: 12/16/91

LABORATORY: TMA

300-FF-5 G.W.

PROJ 91-97

SAMPLE IDENTIFICATION NUMBERS

* see attached sheet

DISPOSITION OF SAMPLES

☐ CANCELLED (REASON)

☐ DAMAGED SAMPLE CONTAINER. ANALYSIS CANCELLED

☐ BROKEN GLASS CONTAMINATING SAMPLE. ANALYSIS CANCELLED

☒ OTHER TMA IS NOT UNDER CONTRACT TO PERFORM TOC + TOX ANALYSIS. SHIP ALL ALIQUOTS FOR TOX + TOC TO THE WESTON LABORATORY.

APPROVED David L. Edwards 12/16/91
PROJECT COORDINATOR DATE

L C Hutchison 12/16/91
TECHNICAL REPRESENTATIVE DATE

9713515.0011

9713515.0012

DON'T SAY IT — WRITE IT!

DATE: December 16, 1991

TO: Delores Sanchez, TMA/Norcal FROM: Daniel L. Edwards, WHC

SUBJECT: 300-FF-5 4th QUARTER GROUNDWATER SAMPLES

Several samples for the 300-FF-5 4th quarter groundwater project (OSM Project Number 91-097) have been sent to the TMA/Norcal laboratory for Total Organic Carbon (TOC) and Total Organic Halogens (TOX) analysis. TMA is not currently contracted to perform these analysis. The sampling team for this project was instructed to ship all TOC and TOX aliquots to the Weston laboratory.

The project coordinator for the 300-FF-5 project would like to have these samples analyzed for TOC and TOX. We request that TMA ship the TOC and TOX aliquots to the Weston laboratory. The shipping address for Weston is:

Weston Laboratory
208 Welsh Pool Road
Lionville, PA 19341
Attn: Josie King

The samples at TMA to date are: B01F03, B01DM6, B01DP1, B01DP4, B01DS8, B01DZ3, B01DT1, B01DT4, B01DX3, B01DZ9, B01DH7, B01DN8, B01DJ3, B01DJ0, and B01DL7. If there are any other 300-FF-5 4th quarter groundwater samples at TMA for TOC and TOX analysis, please route them to the Weston laboratory.

9713515.0013

B01DH7

OFFICE OF SAMPLE MANAGEMENT

RECORD OF DISPOSITION

ROD-92-00041
Record of Disposition No.

DATE: 3-30-92	LABORATORY: TMA
PROJECT TITLE/NO.: 300-FF-5/91-097	NCR NO.: 6124

SAMPLE IDENTIFICATION NUMBERS:

D52 DZ5

B01DZ1	B01DS5	B01F17	B01DQ4	B01F07	B01D52	B01F01	B01F13
B01DY7	B01DR6	B01DR0	B01DQ1	B01F09	B01D25	B01F19	B01F05
B01DY9	B01DR3	B01DQ7	B01DY5	B01F15	B01DK8	B01DR9	
					B01DZ5		

5/29/92 Add:
B01D27
D01FN4
D01DP8
B01F11

DESCRIPTION OF EVENT:

COC's: SAR's listed above samples as needing Pu235/Pu238. They should have been listed as U235 & U238. The Pu isotopic analysis is to be deleted and Uranium isotopic analysis for U235 & U238 added for all listed samples.

DISPOSITION OF SAMPLES:

Analysis was continued, Pu was deleted from request per Dusty Butcher.

APPROVAL SIGNATURES:

KARL POOL — 4-21-92
OSM Project Coordinator (Print/Sign Name) — Date

4/23/92
Technical Representative (Print/Sign Name) — Date

JR McCallum — 4/29/92
Quality Assurance (Print/Sign Name) — Date

RECORD OF DISPOSITION

ROD-92-00045

DATE: 1/29/92 | LABORATORY: TMA 300-FF-5 G.W. 4th Qtr.

SAMPLE IDENTIFICATION NUMBERS

~~B01DH7~~ DJC 1/29/92 * SEE ATTACHED DSI.

DISPOSITION OF SAMPLES

☐ CANCELLED (REASON) _____

☐ DAMAGED SAMPLE CONTAINER. ANALYSIS CANCELLED

☐ BROKEN GLASS CONTAMINATING SAMPLE. ANALYSIS CANCELLED.

☒ OTHER SEE ATTACHED DSI TO DELORES SANCHEZ DATED 1/29/92

APPROVED Daniel L. Edwards 1/29/92
PROJECT COORDINATOR DATE

RC Hulstrom 2/7/92
TECHNICAL REPRESENTATIVE DATE

9713515.0014

9713515.0015

DON'T SAY IT -- WRITE IT!

DATE: January 29, 1992

TO: Delores Sanchez, TMA/NORCAL Laboratory

FROM: Dan Edwards, WHC OSM

SUBJECT: BOD ANALYSIS ON 300-FF-5 GROUNDWATER SAMPLES (4TH QUARTER)

TMA contacted the Office of Sample Management (OSM) concerning Biochemical Oxygen Demand (BOD) analysis for the 300-FF-5 fourth quarter groundwater sampling. TMA stated that by the time the samples had been taken, total activity counts had been performed for shipping purposes, and the samples had arrived at TMA/NORCAL the hold times for BOD had expired or were on the verge of expiring.

In a telecon between L. C. Hulstrom (project coordinator for 300-FF-5) and K. N. Pool (OSM) the week of 12/16/91, it was agreed that the samples that were already at TMA/NORCAL would be analyzed for BOD. The samples to be analyzed for BOD are:

B01DH7	B01DL7	B01DT1
B01DN8	B01DM6	B01DT4
B01DJ3	B01DP1	B01DX3
B01DJ0	B01DP4	B01DZ9
B01DZ3	B01DS8	

All other samples from the 300-FF-5 fourth quarter groundwater sampling that request BOD analysis are NOT to be analyzed for this parameter.

9713515.0016

OFFICE OF SAMPLE MANAGEMENT

RECORD OF DISPOSITION

rod-92-00107
Record of Disposition No.

DATE: 5-13-92

LABORATORY: TMA TMA 5-18-92

PROJECT TITLE/NO.: 300-FF-5

NCR NO.:

SAMPLE IDENTIFICATION NUMBERS:

B01DH7

DESCRIPTION OF EVENT:

A SAMPLE CONTAINER WAS FOUND TO BE LEAKING, WITH APPROXIMATELY 1.6L OF VOLUME REMAINING FOR RADIOCHEMICAL ANALYSIS.

DISPOSITION OF SAMPLES:

THE 300-FF-5 ERE PROJECT COORDINATOR HAS PRIORITIZED THE ANALYSIS FOR RADIOCHEMICAL CONSTITUENTS AS FOLLOWS:

TOTAL ALPHA/TOTAL BETA,GAMMA SCAN AND ISOTOPIC URANIUM. THE ANALYSIS FOR PLUTONIUM,Sr-90,I-129 AND Tc-99 IS CANCELLED DUE TO INSUFFICIENT SAMPLE VOLUME.

APPROVAL SIGNATURES:

KARL POOL/ Karl N. Pool — 5-13-92
OSM Project Coordinator (Print/Sign Name) — Date

LARRY HULSTROM/ LC Hulstrom — 5/29/92
Technical Representative (Print/Sign Name) — Date

Quality Assurance (Print/Sign Name) — Date

OFFICE OF SAMPLE MANAGEMENT

RECORD OF DISPOSITION

ROD-92-00116
Record of Disposition No.

DATE: 6-2-92

LABORATORY: TMA

PROJECT TITLE/NO.: 300-FF-5

NCR NO.:

SAMPLE IDENTIFICATION NUMBERS:

B01DH7

DESCRIPTION OF EVENT:

TMA LABORATORY FOUND SAMPLE B01DH7 LEAKING IN THE REFRIGERATOR, THEY THEN TRANSFERED THE REMAINING VOLUME TO ANOTHER CONTAINER. ENOUGH SAMPLE HAD LEAKED SUCH THAT ALL THE REQUESTED ANALYSIS CAN NOT BE RUN.

DISPOSITION OF SAMPLES:

THE ENVIROMENTAL ENGINEERING PROJECT COORDINATOR WAS CONTACTED (LARRY HULSTROM) TO ASK FOR HIS GUIDANCE ON THE PREFFERED ANALYSIS ON THE REMAINING VOLUUME. PER HIS REQUEST THE ANALYSIS TO BE RUN ON THIS SAMPLE ARE TO BE: ISOTOPIC URANIUM, GROSS ALPHA /GROSS BETA AND GAMMA SCAN. THE PLUTONIUM,STRONTIUM-90,IODINE-129, TECHNETIUM-99 AND TRITIUM ANALYSIS ARE TO BE CANCELLED.

-TMA HAS BEEN NOTIFIED OF THIS DIRECTION.

APPROVAL SIGNATURES:

KARL POOL/ Karl D. Pool — 6-11-92
OSM Project Coordinator (Print/Sign Name) — Date

LARRY HULSTROM/ B. E. Ivins for L. C. Hulstrom — 6-17-92
Technical Representative (Print/Sign Name) — Date

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

9713515.0018

DON'T SAY IT --- *Write It!*

DATE: May 31, 1992

TO: Ted Washington T6-08

FROM: Karl N. Pool T6-08

Telephone: 373-3137

cc:

SUBJECT: ROD for 300-FF-5 Sample

Ted, Please generate an ROD for Sample #B01DH7. The attached memo from TMA provides some of the info you will need for this sample. The bottom line on this sample is this: The lab found the sample container leaking in the refrigerator. They transferred the remaining volume to another container. Enough of the sample had leaked such that all the requested analysis could not be run. The Environmental Engineering Project Coordinator was contacted (Larry Hulstrom) to ask for his guidance on the preferred analysis on the remaining volume. At his request the analysis to be run on this sample are to be; Isotopic Uranium, Gross Alpha/Gross Beta and Gamma Scan. The Plutonium, Strontium-90, Iodine-129, Technetium-99 and Tritium analysis are to be canceled.

Thanx, Karl

9713515.0019

KWP Write Rod on this Event.

MEMORANDUM

To: Karl Pool

From: Dolores Sanchez

Subject: WHC Sample B01DH7 (leaked)
300-FF-5 Project

Date: May 12, 1992

Per telephone conversation, I am requesting for a disposition on the above-referenced sample we have found leaking.

Total volume left = 1.6 Liters

Analysis requested and volume required (in liters) for each test:

PU/Sr-90	1.0 Liter
Isotopic Uranium	1.0
Iodine-129	0.5
Gross Alpha/Beta	0.3
Gamma Scan	0.5
Technetium	0.2

Tritium (separate aliquot was provided for tritium)

Please advise.

GENERAL CHEMISTRY RESULTS

CASE NO. 12-015

Water Sample #:

B01DH7
B01DJ0
B01DJ3
B01DL7
B01DN8
B01DY5
B01DY7
B01DY9
B01DZ1

CASE NARRATIVE

No problems were encountered during sample analysis.

Dennis D. Wells, Project Manager

Page 2 TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91 Results by Sample

SAMPLE ID B01DH7 FRACTION 01B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	5.45	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	4.7	mg/L	0.1
Sulfate	300	30.8	mg/L	0.3

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DH7 FRACTION 01C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
COD	410.1	<30	mg/L	30
Ammonia	350.3	<0.05	mg/L	0.05

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DH7 FRACTION 01D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	8.3	pH	NA
Tot. Dissolved Solids	160.1	255	mg/L	NA
Hardness	130.2	134	mg/L	NA
Alkalinity	310.1	105	mg/L	NA
DO	360.2	41	mg/L	2.0
TSS	160.2	20	mg/L	5

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ0 FRACTION 02B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	5.66	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	<0.1	mg/L	0.1
Sulfate	300	8.6	mg/L	0.3

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ0 FRACTION D2C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
COD	410.1	<30	mg/L	30
Ammonia	350.3	0.07	mg/L	0.05

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ0 FRACTION 02D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	8.4	pH	NA
Tot. Dissolved Solids	160.1	199	mg/L	NA
Hardness	130.2	101	mg/L	NA
Alkalinity	310.1	129	mg/L	NA
DO	360.2	33	mg/L	2.0
TSS	160.2	<5	mg/L	5

FORM I

Received: 12/09/91 Results by Sample

SAMPLE ID B01DJ3 FRACTION 03B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
COD	410.1	<30	mg/L	30
Ammonia	350.2	0.14	mg/L	0.05

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ3 FRACTION 03C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	6.14	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	<0.1	mg/L	0.1
Sulfate	300	<0.3	mg/L	0.3

FORM I

SAMPLE ID B01DJ3 FRACTION 03D TEST CODE WCCLPL NAME Anions and Wet Chemistry
Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	8.5	pH	NA
Tot. Dissolved Solids	160.1	275	mg/L	NA
Hardness	130.2	89	mg/L	NA
Alkalnity	310.1	170	mg/L	NA
DO	360.2	37	mg/L	2.0
TSS	160.2	29	mg/L	5

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DL7 FRACTION 06B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.50	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.1	mg/L	0.1
Sulfate	300	31.4	mg/L	0.3

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DL7 FRACTION 06C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
COD	410.1	<30	mg/L	30
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DL7 FRACTION 06D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.5	pH	NA
Tot. Dissolved Solids	160.1	247	mg/L	NA
Hardness	130.2	128	mg/L	NA
Alkalinity	310.1	103	mg/L	NA
DO	360.2	38	mg/L	2.0
TSS	160.2	9	mg/L	5

FORM I

SAMPLE ID B01DN8 FRACTION 08B TEST CODE WCCLPL NAME Anions and Wet Chemistry
Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.68	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	13.5	mg/L	0.1
Sulfate	300	48.8	mg/L	0.3

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DN8 FRACTION 08C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
COD	410.1	<30	mg/L	30
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DN8 FRACTION 08D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.9	pH	NA
Tot. Dissolved Solids	160.1	392	mg/L	NA
Hardness	130.2	201	mg/L	NA
Alkalinity	310.1	148	mg/L	NA
DO	360.2	41	mg/L	2.0
TSS	16.02	<5	mg/L	5

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY5 FRACTION 10B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.54	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	2.6	mg/L	0.1

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY5 FRACTION 10C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

SAMPLE ID B01DY5 FRACTION 10D TEST CODE WCCLPL NAME Anions and Wet Chemistry
Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.4	pH	NA

FORM I

SAMPLE ID B01DY7 FRACTION 11B TEST CODE WCCLPL NAME Anions and Wet Chemistry
Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.34	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.0	mg/L	0.1

FORM I

SAMPLE ID B01DY7 FRACTION 11C TEST CODE WCCLPL NAME Anions and Wet Chemistry
Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY7 FRACTION 11D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.9	pH	NA

FORM I

SAMPLE ID B01DY9 FRACTION 12B TEST CODE WCCLPL NAME Anions and Wet Chemistry
Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.80	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.3	mg/L	0.1
pH	150.1	8.1	pH	NA

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY9 FRACTION 12C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

SAMPLE ID B01DZ1 FRACTION 13B TEST CODE WCCLPL NAME Anions and Wet Chemistry
Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.57	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.3	mg/L	0.1
pH	150.1	8.1	pH	NA

FORM I

Received: 12/09/91

Results by Sample

SAMPLE ID B01DZ1 FRACTION 13C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

9713515.0046

TMA

JAN 1992
RECEIVED
OSM DMO

WESTINGHOUSE HANFORD COMPANY

Results of Analyses For:

GENERAL CHEMISTRY
Case No. 12-015

and

ORGANICS
Case No. 12-015
(TMA/ARLI Work Order # A1-12-015)

METALS
Case No. N1-12-034
(TMA/Skinner & Sherman W.O.# 91-12-044, -045, -046)

TMA Master Work Order N1-12-034

MS
8/2/96

9713515.0047

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prepared for

TMA / Norcal

WORK ORDER #9112044

TMA
Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.

300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713515.0048

 Skinner&Sherman REPORT Work Order # 91-12-044

Received: 12/07/91 01/23/92 10:01:32

REPORT TMA/NORCAL
TO 2030 Wright Avenue
Richmond, CA 94804

ATTEN Dan Steurmer

CLIENT HANFORD NOR SAMPLES 5
COMPANY TMA/NORCAL
FACILITY Richmond, CA

PREPARED TMA / Skinner & Sherman Labs.
BY 300 Second Avenue
P.O. Box 521
Waltham, MA 02254

ATTEN Client Services
PHONE (617) 890-7200

CERTIFIED BY

CONTACT DP

WORK ID N1-12-034
TAKEN By Client
TRANS Fedex #1414547536
TYPE 5 Waters
P.O. # N1-12-034
INVOICE under separate cover

SAMPLE IDENTIFICATION	
01	B01DH7
01	B01DH7 (Dupl)
02	B01DJ0
03	B01DJ3
04	B01DL7
05	B01DN8

TEST CODES and NAMES used on this workorder

BOD W Biochemical Oxygen Demand

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc. retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc. will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713515.0049

 Skinner&Sherman REPORT Work Order # 91-12-044

Received: 12/07/91 Results by Sample

SAMPLE ID B01DH7 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 12/02/91 Category WATER

BOD_W <2
mg/L

SAMPLE ID B01DH7 (Dupl) SAMPLE # 01 FRACTIONS: B
Date & Time Collected 12/02/91 Category WATER

BOD_W <2
mg/L

SAMPLE ID B01DJ0 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 12/02/91 Category WATER

BOD_W 2
mg/L

SAMPLE ID B01DJ3 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 12/02/91 Category WATER

BOD_W <2
mg/L

SAMPLE ID B01DL7 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 12/03/91 Category WATER

BOD_W <2
mg/L

SAMPLE ID B01DN8 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 12/03/91 Category WATER

BOD_W <2
mg/L

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc. retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc. will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

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1-800-4 LAB TEST FAX (617) 890-3883

9713515.0050

Received: 12/07/91 01/23/92 10:01:32

TMA/NORCAL

QUALITY CONTROL

DUPLICATE

Sample ID	Sample Result	Duplicate Result	Relative % Difference
B01DH7	<2 mg/L	<2 mg/L	not calculable

QUALITY CONTROL SAMPLES

Sample ID	True Value	Found Value	% Recovery
Standard	200 mg/L	184 mg/L	92.0

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc. retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc. will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc. 300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

9713515.0051

Received: 12/07/91 Test Methodology

TEST CODE BOD W NAME Biochemical Oxygen Demand

Standard Methods for the Examination of Water and Wastewater, (16th Edition, 1985), Method 507.

TMA
Thermo Analytical Inc.
Skinner & Sherman Laboratories Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc. retains ownership of this report until associated submitted invoice is satisfied. Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Client will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invoice amount. The results listed refer only to tested samples and applicable parameters. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc. will exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held for thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

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1-800-4 LAB TEST FAX (617) 890-3883

9713515.0052

TOC/TOX

WESTON

STANDARD INORGANIC REVIEW

RFW LOT: 91126696 # OF SAMPLES: 14 DATE: 1/6

CLIENT: Westinghouse Hanford MATRIX: Water INITIAL: MMZ

W.O.: 6162-02-01 RECEIPT DATE: 12/11 TYPE: (I) / M

CLIENT IDS MATCH: yes ✓ no___ ALL TESTS REPORTED: yes ✓ no___

HOLDING TIMES MET: yes___ no___ if no, list samples_____

(labchron) _____

see reference list _____

BLANK CONTAMINATION: no ✓ yes___ if yes, list balnks_____

(Inorganics method blank data summary page) _____

limits: all results below DL (u) _____

CALIBRATION VERIFICATION is not found in the current standard data report.

MATRIX SPIKE RECOVERIES: all OK ✓ except___ list tests & recoveries

(Inorganics accuracy report) _____

limits: 75% - 125% ✓ MSP _____

BLANK SPIKE RECOVERIES: all OK P/R except___ list tests & recoveries

LABORATORY CONTROL STANDARDS

(Inorganics accuracy report) _____

(Inorganics laboratory control standards report) _____

limits: 80% - 120%

BLK SPIKE DUP RECOVERIES: all OK___ except___ list tests & recoveries

(Inorganics duplicate spike report) _____

limits: < 20% _____

REPLICATE RESULTS: all OK ✓ except___ list tests & recoveries

(Inorganics precision report) _____

limits: < 20% _____

JUL 1995
RECEIVED
Data
Log In

9713515.0053

ROY F. WESTON, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 12-11-91
RFW #: 9112L696
W.O. #: 6168-02-01

INORGANIC NARRATIVE

The following is a summary of the quality control results and a description of any problems encountered during the analysis of this batch of samples:

1. All sample holding times as required by 40CFR136 were met.

2. All preparation blank results were below the required detection limit.

3. All calibration verification checks were within the required control limits of 90-110%. Calibration verification is performed using independent standards.

4. Matrix spike recoveries are summarized on the Inorganic Accuracy Report contained within this document. All recoveries were within the 75-125% guidance limits. All %RPD were within the 20% guidance limit.

5. Replicate results are summarized on the Inorganic Precision Report contained within this document. All results were within the 20% RPD guidance limit.

6. The analytical methods applied by the laboratory, unless otherwise requested, for all inorganic analyses are derived from the USEPA Method for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020) and Standard Methods for the Examination of Water and Wastewater 16 ed. Methods for the analysis of solid samples are derived from Test Methods for Evaluating Solid Waste (USEPA SW846).

Jack R. Tuschall, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

1-8-92
Date

JUL 1995
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Data
Log In

pas.21\i12-696

ROY F. WESTON, INC.
GLOSSARY OF TERMS - INORGANIC REPORTS

DATA QUALIFIERS

U - Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* - Indicates that the original sample result is greater than 4x the spike amount added. The USEPA-CLP has determined that spike results on samples where this occurs may be unreliable and therefore, the control limits are not applicable.

ABBREVIATIONS

MB - Method or preparation blank
MS - Matrix Spike
MSD - Matrix Spike Duplicate.
REP - Sample Replicate.
LC - Indicates a method LCS or Blank Spike.
NC - Not calculable, result below the detection limit.

A suffix of -R and -S following these codes indicates a replicate and spike analysis respectively.

ANALYTICAL METAL METHODS

As :	EPA 206.2	Se :	EPA 270.2
Pb :	EPA 239.2	ICP Scan :	EPA 200.7
Hg :	EPA 245.1	All Others :	EPA 200.7
Tl :	EPA 279.2	EP Leachates (except Hg) :	200.7

The analytical methods applied by the laboratory for the determination of drinking water is 5.2.1.

NOTES

The laboratory prepares a matrix spike at one per 20 frequency for TCLP samples. The Federal Register recommends that all matrix spikes be prepared at greater than 50% of the indigenous analyte concentration. A matrix duplicate is also prepared.

Holding times for soil samples have not been promulgated by the USEPA.

For solid samples, all results are reported on a dry weight basis.

9213515.0055

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 01/02/92

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 6168-02-01-0000

WESTON BATCH #: 9112L696

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-001	B01DT1	Total Organic Carbon	3.6	MG/L	0.50
-002	B01DT4	Total Organic Carbon	1.2	MG/L	0.50
-003	B01DX3	Total Organic Carbon	0.54	MG/L	0.50
-004	B01DZ9	Total Organic Carbon	0.50 u	MG/L	0.50
-005	B01DH7	Total Organic Carbon	0.74	MG/L	0.50
-006	B01DJ0	Total Organic Carbon	2.0	MG/L	0.50
-007	B01DJ3	Total Organic Carbon	1.3	MG/L	0.50
-008	B01DL7	Total Organic Carbon	0.64	MG/L	0.50
-009	B01DN8	Total Organic Carbon	0.74	MG/L	0.50
-010	B01DM6	Total Organic Carbon	0.94	MG/L	0.50

9713515.0056

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 01/02/92

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 6168-02-01-0000

WESTON BATCH #: 9112L696

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
-011	B01DP1	Total Organic Carbon	0.64	MG/L	0.50
-012	B01DP4	Total Organic Carbon	0.54	MG/L	0.50
-013	B01DS8	Total Organic Carbon	0.84	MG/L	0.50
-014	B01DZ3	Total Organic Carbon	0.64	MG/L	0.50

9713515.0057

ROY F. WESTON INC.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/02/92

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 6168-02-01-0000

WESTON BATCH #: 9112L696

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT
BLANK10	91LTC161-MB1	Total Organic Carbon	0.50 u	MG/L	0.50
BLANK20	91LTC161-MB2	Total Organic Carbon	0.50 u	MG/L	0.50
BLANK30	91LTC161-MB3	Total Organic Carbon	0.50 u	MG/L	0.50

9713515.0058

ROY F. WESTON INC.

INORGANICS ACCURACY REPORT 01/02/92

CLIENT: WESTINGHOUSE HANFORD

WESTON BATCH #: 9112L696

WORK ORDER: 6168-02-01-0000

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV
-007	B01DJ3	Total Organic Carbon	5.5	1.3	5.0	83.3
		Total Organic Carbon	5.8	1.3	5.0	89.2
BLANK10	91LTC161-MB1	Total Organic Carbon	4.5	0.50u	5.0	90.1
		Total Organic Carbon	4.5	0.50u	5.0	90.1
BLANK20	91LTC161-MB2	Total Organic Carbon	4.7	0.50u	5.0	94.1
BLANK30	91LTC161-MB3	Total Organic Carbon	4.6	0.50u	5.0	92.1

9713515.0059

ROY F. WESTON INC.

INORGANICS DUPLICATE SPIKE REPORT 01/02/92

CLIENT: WESTINGHOUSE HANFORD

WESTON BATCH #: 9112L696

WORK ORDER: 6168-02-01-0000

SAMPLE	SITE ID	ANALYTE	SPIKE#1 %RECOV	SPIKE#2 %RECOV	%DIFF
-007	B01DJ3	Total Organic Carbon	83.3	89.2	6.9
BLANK10	91LTC161-MB1	Total Organic Carbon	90.1	90.1	0.00

9713515.0060

ROY F. WESTON INC.

INORGANICS PRECISION REPORT 01/02/92

CLIENT: WESTINGHOUSE HANFORD

WESTON BATCH #: 9112L696

WORK ORDER: 6168-02-01-0000

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	% DIFF
-007REP	B01DJ3	Total Organic Carbon	1.3	1.2	7.7

9213515.0061

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
WESTINGHOUSE HANFORD

DATE RECEIVED: 12/11/91 RFW LOT # :9112L696

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B01DT1						
TOTAL ORGANIC CARBON	001	W	91LTC161	12/05/91	12/30/91	12/30/91
B01DT4						
TOTAL ORGANIC CARBON	002	W	91LTC161	12/05/91	12/30/91	12/30/91
B01DX3						
TOTAL ORGANIC CARBON	003	W	91LTC161	12/05/91	12/30/91	12/30/91
B01DZ9						
TOTAL ORGANIC CARBON	004	W	91LTC161	12/05/91	12/30/91	12/30/91
B01DH7						
TOTAL ORGANIC CARBON	005	W	91LTC161	12/02/91	12/30/91	12/30/91
B01DJ0						
TOTAL ORGANIC CARBON	006	W	91LTC161	12/02/91	12/30/91	12/30/91
B01DJ3						
TOTAL ORGANIC CARBON	007	W	91LTC161	12/02/91	12/30/91	12/30/91
TOTAL ORGANIC CARBON	007 REP	W	91LTC161	12/02/91	12/30/91	12/30/91
TOTAL ORGANIC CARBON	007 MS	W	91LTC161	12/02/91	12/30/91	12/30/91
TOTAL ORGANIC CARBON	007 MSD	W	91LTC161	12/02/91	12/30/91	12/30/91
B01DL7						
TOTAL ORGANIC CARBON	008	W	91LTC161	12/03/91	12/30/91	12/30/91
B01DN8						
TOTAL ORGANIC CARBON	009	W	91LTC161	12/03/91	12/30/91	12/30/91
B01DM6						
TOTAL ORGANIC CARBON	010	W	91LTC161	12/04/91	12/30/91	12/30/91

9713515.0062

Roy F. Weston, Inc. - Lionville Laboratory
INORGANIC ANALYTICAL DATA PACKAGE FOR
WESTINGHOUSE HANFORD

DATE RECEIVED: 12/11/91 RFW LOT # :9112L696

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B01DP1						
TOTAL ORGANIC CARBON	011	W	91LTC161	12/04/91	12/30/91	12/30/91
B01DP4						
TOTAL ORGANIC CARBON	012	W	91LTC161	12/04/91	12/30/91	12/30/91
B01DS8						
TOTAL ORGANIC CARBON	013	W	91LTC161	12/04/91	12/30/91	12/30/91
B01DZ3						
TOTAL ORGANIC CARBON	014	W	91LTC161	12/04/91	12/30/91	12/30/91

LAB QC:

TOTAL ORGANIC CARBON	MB1	W	91LTC161	N/A	12/30/91	12/30/91
TOTAL ORGANIC CARBON	MB1 BS	W	91LTC161	N/A	12/30/91	12/30/91
TOTAL ORGANIC CARBON	MB1 BSD	W	91LTC161	N/A	12/30/91	12/30/91
TOTAL ORGANIC CARBON	MB2	W	91LTC161	N/A	12/30/91	12/30/91
TOTAL ORGANIC CARBON	MB2 BS	W	91LTC161	N/A	12/30/91	12/30/91
TOTAL ORGANIC CARBON	MB3	W	91LTC161	N/A	12/30/91	12/30/91
TOTAL ORGANIC CARBON	MB3 BS	W	91LTC161	N/A	12/30/91	12/30/91

9713515.0063

WESTON

TOC ANALYSIS LOG

2528

ALYST: [illegible]
TE: 12/30/91
RT TIME 0830

CAL STD ID:: FISHER
ICV/CCV STD ID: ALDRICH
END TIME 1600

LOGBOOK #
PREP BATCH: 91LTC161
WORKSHEET: TOC1230
METHOD: SM 505B

RFW #	QC INFO	PH <2	SAMPLE ID	DILN FACTOR	INST READING	MG/L	% REC.
BLANK					0.3		
0.5ppm					0.9		
1.0					1.4		
5.0					4.7		
10.0					9.9		
25.0					25.6		
BLANK					0.2	<0.5	
ICV	5ppm				4.7	4.5	89.2
ICV DUP					4.7	4.5	89.2
9112696-001	CV3	✓	5013 T1		3.8	3.6	
002		✓	T4		1.4	1.2	
003		✓	X3		0.7	0.5	
004		✓	Z9		0.6	<0.5	
005		✓	H7		0.9	0.7	
006		✓	50		2.2	2.0	
007		✓	53		1.5	1.3	
007 DUP		✓			1.4	1.2	
007 spike	5ppm	✓			5.7	5.5	83.3
007 spike dup		✓			6.0	5.8	89.2
008		✓	L7		0.8	0.6	
BLANK					0.2	<0.5	
CCV	5ppm				4.9	4.7	93.2
009		✓	N8		0.9	0.7	
010		✓	M6		1.1	0.9	

RFW 21-21-004/W-09/91

REVIEWED BY/DATE: J Henderson 1-3-92

PAGE # 19

9713515.0064

WESTON

TOC ANALYSIS LOG

2528

ANALYST: S.A. Lund
DATE: 12/30/91
START TIME 0830

CAL STD ID:: FISHER
ICV/CCV STD ID: ALDRICH
END TIME 1600

LOGBOOK #
PREP BATCH: 91LTC161
WORKSHEET: TOC1230
METHOD: SM 505B

RFW #	QC INFO	PH <2	SAMPLE ID	DILN FACTOR	INST READING	MG/L	% REC.
696-011		✓	P1		0.8	0.6	
012		✓	P4		0.7	0.5	
013		✓	S8		1.0	0.8	
014		✓	Z3		0.8	0.6	
9112L688-001		✓	05-5007-m002		2.4	2.2	
9112L719-001	LCS	✓	06-5033-m001		3.6	3.4	
9112L718-001		✓	06-5035 m003	1:1	19.1	37.6	
002		✓	m203		0.3	<0.5	
002 DUP		✓			0.4	<0.5	
002 spike	5ppm	✓			5.0	4.8	93.2
002 spike dup		✓			5.0	4.8	93.2
003		✓		1:1	20.9	41.1	
004		✓			1.0	0.8	
005		✓			17.0	16.7	
BLANK					0.2	<0.5	
CCV	5ppm				4.8	4.6	91.2

S.A. Lund

RFW 21-21-004/W-09/91

REVIEWED BY/DATE: J Henderson JHH 1-3-92

PAGE # 20

WESTON Analytics Use Only

9112L696

Custody Transfer Record/Lab Work Request

WESTON

Client: Westinghouse Hanford
Est. Final Proj. Sampling Date:
Work Order #: 6168-02-01
Project Contact/Phone #:
AD Project Manager: Josie King
QC: CLP Del: CLP TAT: 35 day
Date Rec'd: 12-11-91 Date Due: 1-15-92
Account #: WS-HANFORD

Refrigerator #							12-12-91 B1	1									
#/Type Container	Liquid						1G	1G									
	Solid																
Volume	Liquid						250	250									
	Solid																
Preservatives							H2SO4	H2SO4									
ANALYSES REQUESTED →		ORGANIC								INORG							
		VOA	BNA	Pest/PCB	Herb		TOX	TOC		Metal	CN						
		WESTON Analytics Use Only															
							OTOX	TOCT									

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected												
001	B01DT1 ~~(RAD)~~			W	12-5-91						✓	✓						
002	B01DT4	12-11-91									✓	✓						
003	B01DX3										✓	✓						
004	B01DZ9										✓	✓						
005	B01DH7				12-2-91						✓	✓						
006	B01DJ0										✓	✓						
007	B01DJ3				12-2-91						✓	✓						
008	B01DL7				12-3-91						✓	✓						
009	B01DN8										✓	✓						
010	B01DM6				12-4-91						✓	✓						

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions: TASK 300-FF-5

RAD info to follow.

MS/MSD Required on Each Batch & Each Matrix

original Carrier

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were: 1) Shipped ✓ or Hand Delivered ___ Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was: 1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N
COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
Fred-X	[signature]	12-11-91	10:50
[signature]		12-11-91	

Relinquished by	Received by	Date	Time
	[signature]	12-11-91	

Westinghouse only

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ 1414452701 381-596a

9213515.0065

WESTON Analytics Use Only
9112L696

Custody Transfer Record/Lab Work Request

WESTON

Client: Westinghouse Hanford
Est. Final Proj. Sampling Date:
Work Order #:
Project Contact/Phone #:
AD Project Manager: Lee Fogel
QC: Del TAT:
Date Rec'd: Date Due:
Account #:

Refrigerator #							1	1									
#/Type Container	Liquid						1G	1G									
	Solid																
Volume	Liquid						250	250									
	Solid																
Preservatives							[illegible]	[illegible]									
ANALYSES REQUESTED →		ORGANIC					TOX	TOC		INORG							
		VOA	BNA	Pest/PCB	Herb					Metal	CN						

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	WESTON Analytics Use Only														
											TOX	TOC									
011	B01DP1			W	12-4-91						✓	✓									
012	B01DP4										✓	✓									
013	B01DS8										✓	✓									
014	B01DZ3										✓	✓									

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
	12-11-91				12-11-91		

RFW 21-21-001/A-7/91 ___ L372 ___ L373 ___ L375 ___ L377 ___ L378 Ref# ___ Cooler# ___ 381-596a

9713515.0066

91-2-496

QUESTIONS? CALL 800-238-5355 TOLL-FREE.

TRACKING NUMBER

4414452701

Date 10 DEC 91 12

RECIPIENT'S COPY

Print

Your Phone Number (Very important) 510-235-2633

Department/Floor No.

/NORCAL

30 WRIGHT AVE

RICHMOND CA 94804

2 To (Recipient's Name) Please Print: Sample Control

Recipient's Phone Number (Very: (215) 524-6

Department/

Company: Roy F. Weston Inc.

Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. Zip Codes.): 208 Weisn Pool Road

City: Lionville State: PA ZIP Required: 19341-1

YOUR INTERNAL BILLING REFERENCE INFORMATION (optional) (First 24 characters will appear on invoice.): 2320-6406

H IF HOLD FOR PICK-UP, Print FEDEX Address Here: Street Address

City State ZIP Required

3 PAYMENT 1 ☒ Bill Sender 2 ☐ Bill Recipient's FedEx Acct. No. 3 ☐ Bill 3rd Party FedEx Acct. No. 4 ☐ Bill Credit Card 5 ☐ Cash/Check

4 SERVICES (Check only one box)

Priority Overnight (Delivery by next business morning†)	Standard Overnight (Delivery by next business afternoon†)
11 ☒ YOUR PACKAGING	51 ☐ YOUR PACKAGING
16 ☐ FEDEX LETTER *	56 ☐ FEDEX LETTER *
12 ☐ FEDEX PAK *	52 ☐ FEDEX PAK *
13 ☐ FEDEX BOX	53 ☐ FEDEX BOX
14 ☐ FEDEX TUBE	54 ☐ FEDEX TUBE
Economy Two-Day (Delivery by second business day†)	**Government Overnight** (Restricted to authorized users only)
30 ☐ ECONOMY	46 ☐ GOVT LETTER
	41 ☐ GOVT PACKAGE

Freight Service (for Extra Large or any package over 150 lbs.)

70 ☐ OVERNIGHT FREIGHT ** (Commercial destination required)

80 ☐ TWO-DAY FREIGHT **

† Delivery commitment may be slow in some areas

*Declared Value Limit $100

**Call for delivery schedule

5 DELIVERY AND SPECIAL HANDLING (Check services required)

1 ☐ HOLD FOR PICK-UP (Fill in Box H)

2 ☒ DELIVER WEEKDAY

3 ☐ DELIVER SATURDAY (Extra charge) (Not available to all locations)

4 ☐ DANGEROUS GOODS (Extra charge)

5 ☐

6 ☐ DRY ICE _____ LBS.

7 ☐ OTHER SPECIAL SERVICE _____

8 ☐

9 ☐ SATURDAY PICK-UP (Extra charge)

10 ☐

11 ☐

12 ☐ HOLIDAY DELIVERY (If allowed) (Extra charge)

6 PACKAGES | WEIGHT (in Pounds Only) | YOUR DECLARED VALUE

1.46

Total | Total | Total

1 4.6

DIM SHIPMENT (Chargeable Weight) ☐ LBS

X X

Received At

1 ☐ Regular Stop 3 ☐ Drop Box 4 ☐ BSC 5 ☐ Station 2 ☐ On Call Stop

7 Emp. No. | Date

☐ Cash Received

☐ Return Shipment

☐ Third Party ☐ Chg. To Del. ☐ Chg. To Hold

Street Address

City State Zip

Received By: X

Date/Time Received: 12-11-91 FedEx Employee Number: 10:30

Release Signature

FedEx Emp. No. Date/Time

Federal Expre

Base Charges

Declared Value

Other 1

Other 2

Total Charges

REVISION DATE 6/9

PART #137204 FXI

FORMAT #099

099

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9713515.0068

WESTON

PACKAGE TRACKING

RFW # : 9112L696 FRACTION: GTOX

CLIENT: WESTINGHOUSE W. O. #: _____

DATA ENTERED BY: CIMS DATE: 12-31-91

DATA PROOFED BY: _____ DATE: _____

DATE CASE NARRATIVE GIVEN TO TYPING : 12-31-91

DATE CASE NARRATIVE RETURNED FROM TYPING : _____

CASE NARRATIVE RETURNED TO TYPING FOR CORRECTIONS : _____

NEEDS:

SIGNED C.O.C. : _____ SIGNED C.O.C. RECEIVED : _____

SIGNATURE : _____

REVIEWED BY : KAMLA TIWARI : _____
LINDA HAYHURST : _____
JOHN HUMPHREYS : _____
SOM BASUTHAKUR : _____
JANICE FEHR : _____

PAGINATE : _____
DATA PACKAGE SENT : _____

COMMENTS : _____

JUL 1995
RECEIVED
Data
Log In

PAST HOLDING TIME y— n.

9713515.0069

WESTON

ROY F. WESTON, INC.
Lionville Laboratory

Client: WESTINGHOUSE HANFORD
RFW # : 9112L696
W.O. #: 6168-02-01-0000
TOX RESULTS

The following qualifiers/codes are used on the data summary:

U - Indicates that the compound was analyzed for but not detected. The detection limit for the sample (not the method detection limit) is reported with U (e.g., 10u).

J - Indicates an estimated value. This flag is used in cases where a target analyte is detected at a level less than the lower quantification level. If the limit of quantification is 10ug/L and a concentration of 3ug/L is calculated, it is reported as 3J.

BS - Indicate blank spike in which reagent grade water is spiked with the spiking solution and carried through all the steps in the method. Spike recoveries are reported.

BSD - Indicates blank spike duplicate.

MS - Indicates matrix spike.

MSD - Indicates matrix spike duplicate.

NA = Not Applicable.

NR = Not Required.

Date Received : 12/11/91
Date of Analysis : 12/18,19/91

for J. Michael Taylor
Project Director
Lionville Analytical Laboratory

12/31/91
DATE

Roy F. Weston, Inc. - Lionville Laboratory
Total Organic Halides

RFW Batch Number: 91121696 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-01-0000 Report Date: 12/27/91 17:41 Page: 1

	Cust ID:	B01DT1	B01DT1	B01DT4	B01DT4	B01DX3	B01DX3
Sample Information	RFW#:	001	001 REP	002	002 REP	003	003 REP
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Total Organic Halides		37	56	20 U	20 U	43	32

	Cust ID:	B01DZ9	B01DZ9	B01DH7	B01DH7	B01DJ0	B01DJ0
Sample Information	RFW#:	004	004 REP	005	005 REP	006	006 REP
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Total Organic Halides		20 U	23	20 U	20 U	20 U	20 U

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

JUL 1995
RECEIVED
Data
Log In

9713515.0070

Roy F. Weston, Inc. - Lionville Laboratory
Total Organic Halides

RFW Batch Number: 9112L696 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-01-0000 Report Date: 12/27/91 17:41 Page: 2

	Cust ID:	B01DJ3	B01DJ3	B01DL7	B01DL7	B01DN8	B01DN8
Sample Information	RFW#:	007	007 REP	008	008 REP	009	009 REP
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Total Organic Halides		20 U	20 U	61	87	110	84

	Cust ID:	B01DM6	B01DM6	B01DP1	B01DP1	B01DP4	B01DP4
Sample Information	RFW#:	010	010 REP	011	011 REP	012	012 REP
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Total Organic Halides		20 U	24	41	66	21	32

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

9713515.0071

Roy F. Weston, Inc. - Lionville Laboratory
Total Organic Halides

RFW Batch Number: 9112L696 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-01-0000 Report Date: 12/27/91 17:41 Page: 3

	Cust ID:	B01DS8	B01DS8	B01DZ3	B01DZ3	PBLK	PBLK BS
Sample Information	RFW#:	013	013 REP	014	014 REP	91DTX322-MB1	91DTX322-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Total Organic Halides		25	25	20 U	20 U	20 U	84 %

	Cust ID:	PBLK	PBLK BS	PBLK	PBLK BS	PBLK	PBLK BS
Sample Information	RFW#:	91DTX323-MB1	91DTX323-MB1	91DTX324-MB1	91DTX324-MB1	91DTX325-MB1	91DTX325-MB1
	Matrix:	WATER	WATER	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00	1.00	1.00
	Units:	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Total Organic Halides		20 U	123 %	20 U	105 %	20 U	90 %

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

9713515.0072

9713515.0073

Roy F. Weston, Inc. - Lionville Laboratory
TOX ANALYTICAL DATA PACKAGE FOR
WESTINGHOUSE HANFORD

DATE RECEIVED: 12/11/91 RFW LOT # :9112L696

CLIENT ID	RFW #	MTX	PREP =	COLLECTION	EXTR/PREP	ANALYSIS
B01DT1	001	W	91DTX322	12/05/91	12/18/91	12/18/91
B01DT1	001 REP	W	91DTX322	12/05/91	12/18/91	12/18/91
B01DT4	002	W	91DTX323	12/05/91	12/18/91	12/18/91
B01DT4	002 REP	W	91DTX323	12/05/91	12/18/91	12/18/91
B01DX3	003	W	91DTX322	12/05/91	12/18/91	12/18/91
B01DX3	003 REP	W	91DTX322	12/05/91	12/18/91	12/18/91
B01DZ9	004	W	91DTX323	12/05/91	12/18/91	12/18/91
B01DZ9	004 REP	W	91DTX323	12/05/91	12/18/91	12/18/91
B01DH7	005	W	91DTX322	12/02/91	12/18/91	12/18/91
B01DH7	005 REP	W	91DTX322	12/02/91	12/18/91	12/18/91
B01DJ0	006	W	91DTX323	12/02/91	12/18/91	12/18/91
B01DJ0	006 REP	W	91DTX323	12/02/91	12/18/91	12/18/91
B01DJ3	007	W	91DTX322	12/02/91	12/18/91	12/18/91
B01DJ3	007 REP	W	91DTX322	12/02/91	12/18/91	12/18/91
B01DL7	008	W	91DTX323	12/03/91	12/18/91	12/18/91
B01DL7	008 REP	W	91DTX323	12/03/91	12/18/91	12/18/91
B01DN8	009	W	91DTX324	12/03/91	12/19/91	12/19/91
B01DN8	009 REP	W	91DTX324	12/03/91	12/19/91	12/19/91
B01DM6	010	W	91DTX325	12/04/91	12/19/91	12/19/91
B01DM6	010 REP	W	91DTX325	12/04/91	12/19/91	12/19/91
B01DP1	011	W	91DTX324	12/04/91	12/19/91	12/19/91
B01DP1	011 REP	W	91DTX324	12/04/91	12/19/91	12/19/91
B01DP4	012	W	91DTX325	12/04/91	12/19/91	12/19/91
B01DP4	012 REP	W	91DTX325	12/04/91	12/19/91	12/19/91
B01DS8	013	W	91DTX324	12/04/91	12/19/91	12/19/91
B01DS8	013 REP	W	91DTX324	12/04/91	12/19/91	12/19/91
B01DZ3	014	W	91DTX325	12/04/91	12/19/91	12/19/91
B01DZ3	014 REP	W	91DTX325	12/04/91	12/19/91	12/19/91
LAB QC:						
	MB1	W	91DTX322	N/A	12/18/91	12/18/91
	MB1 BS	W	91DTX322	N/A	12/18/91	12/18/91
	MB1	W	91DTX323	N/A	12/18/91	12/18/91
	MB1 BS	W	91DTX323	N/A	12/18/91	12/18/91
	MB1	W	91DTX324	N/A	12/19/91	12/19/91
	MB1 BS	W	91DTX324	N/A	12/19/91	12/19/91
	MB1	W	91DTX325	N/A	12/19/91	12/19/91
	MB1 BS	W	91DTX325	N/A	12/19/91	12/19/91

WESTON Analytics Use Only

9112L696

Custody Transfer Record/Lab Work Request

WESTON

Client: Westinghouse Hanford
Est. Final Proj. Sampling Date:
Work Order #: 6168-02-01
Project Contact/Phone #:
AD Project Manager: Josie King
QC: CLP Del: CLP TAT: 35 day
Date Rec'd: 12-11-91 Date Due: 1-15-92
Account #: WS-HANFORD

Refrigerator #								12-7-91										
# Type Container	Liquid							G1	1									
	Solid							1G	1G									
Volume	Liquid							250	250									
	Solid																	
Preservatives								H2SO4	H2SO4									
ANALYSES REQUESTED →		ORGANIC						TOX	TOC		INORG							
		VOA	BNA	Pest/PCB	Herb						Metal	CN						
WESTON Analytics Use Only								OTOX	TOC									

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	OTOX	TOC
001	B01DT1 (RAD)	11-91		W	12-5-91		✓	✓
002	B01DT4						✓	✓
003	B01DX3						✓	✓
004	B01DZ9						✓	✓
005	B01DH7				12-2-91		✓	✓
006	B01DJ0						✓	✓
007	B01DJ3				12-2-91		✓	✓
008	B01DL7				12-3-91		✓	✓
009	B01DN8						✓	✓
010	B01DM6				12-4-91		✓	✓

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions: TASK 300-FF-5

RAD info to follow.

MS/MSD Required on Each Batch & Each Matrix

Original Requisition

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # ___
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time
Fed-X	[signature]	12-11-91	10:50
	[signature] 12-11-91		

Relinquished by	Received by	Date	Time
	[signature]		
	[signature] 12-11-91		

RF W 21 21 001/A 7/91 L372 L373 L375 L377 L378 Ref# 1414452701 381 596a

9113515.0074

WESTON Analytics Use Only
9112L696

Custody Transfer Record/Lab Work Request

WESTON

Client: Westinghouse Hanford
Est. Final Proj. Sampling Date:
Work Order #:
Project Contact/Phone #:
AD Project Manager: Lee Rogel
QC: Del TAT
Date Rec'd: Date Due:
Account #:

Refrigerator #								1	1								
# Type Container	Liquid							1G	1G								
	Solid																
Volume	Liquid							250	250								
	Solid																
Preservatives								NaOH	NaOH								
ANALYSES REQUESTED →								ORGANIC					INORG				
								VOA	BNA	Pest/PCB	Herb	TOX	TOC		Metal	CN	
								WESTON Analytics Use Only									
												OTOX	IOC				

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

Lab ID	Client ID Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected															
011	B01DP1			W	12-4-91							✓	✓								
012	B01DP4											✓	✓								
013	B01DS8											✓	✓								
014	B01DZ3											✓	✓								

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:

DATE/REVISIONS:
1
2
3
4
5
6

WESTON Analytics Use Only

Samples were:
1) Shipped ___ or Hand Delivered ___
Airbill # _____
2) Ambient or Chilled
3) Received in Good Condition Y or N
4) Labels Indicate Properly Preserved Y or N
5) Received Within Holding Times Y or N

COC Tape was:
1) Present on Outer Package Y or N
2) Unbroken on Outer Package Y or N
3) Present on Sample Y or N
4) Unbroken on Sample Y or N

COC Record Present Upon Sample Rec't Y or N

Discrepancies Between Samples Labels and COC Record? Y or N
NOTES:

Relinquished by	Received by	Date	Time	Relinquished by	Received by	Date	Time
	12-11-91				12-11-91		

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# _____ Cooler# _____ 381-596a

9713515.0075

9713515.0076

JAN 1992
RECEIVED
OSM DMO

CASE NO. 12-015

DATA SUMMARY REPORT
ORGANICS

PREPARED BY:

TMA ARLI
160 TAYLOR ST.
MONROVIA CA 91016

CASE NARRATIVE

LABORATORY: TMA/ARLI

CASE: 12-015

CONTRACT ID: WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE: December 5, 1991

1.0 DESCRIPTION OF CASE:

Eleven water samples were analyzed for full TCL Organics (Volatiles, Semivolatiles and Pesticide/PCB's) according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision 2/88.

The samples for Pesticide/PCB and Semivolatile analyses had insufficient sample volume to perform MS and MSD analyses. As per Westinghouse Hanford Company, a QC case (01-032) has been created using laboratory water. This case will be sent as an addendum to this case.

2.0 SAMPLE LIST:

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B01DH7	A1-12-015-01A	SV & P	WATER
B01DH7	A1-12-015-01E	V	WATER
B01DJ0	A1-12-015-02A	SV & P	WATER
B01DJ0	A1-12-015-02E	V	WATER
B01DJ3	A1-12-015-03A	SV & P	WATER
B01DJ3	A1-12-015-03E	V	WATER
B01F60	A1-12-015-05A	V	WATER
B01DL7	A1-12-015-06A	SV & P	WATER
B01DL7	A1-12-015-06E	V	WATER
B01DN8	A1-12-015-08A	SV & P	WATER
B01DN8	A1-12-015-08F	V	WATER
B01F61	A1-12-015-09A	V	WATER
B01DY5	A1-12-015-10A	P	WATER
B01DY5	A1-12-015-10E	V	WATER
B01DY7	A1-12-015-11A	P	WATER
B01DY7	A1-12-015-11E	V	WATER
B01DY9	A1-12-015-12A	P	WATER
B01DY9	A1-12-015-12D	V	WATER
B01DZ1	A1-12-015-13A	P	WATER
B01DZ1	A1-12-015-13D	V	WATER

3.0 COMMENTS:

3.1 SHIPPING AND DOCUMENTATION:

All samples were received unbroken and properly documented with the exception of samples B01DH8, B01DJ1, and B01DL8. These samples were listed on WHC Chain of Custody, however, TMA/ARLI did not receive them for volatiles analysis.

3.2 ANALYSIS:

3.2.1 VOLATILE ANALYSIS COMMENTS:

LOW LEVEL WATER :

The samples were analyzed within the CLP SOW holding time. All of the QC results were within the limits specified in the EPA CLP SOW.

TUNES:

All the BFB tunes are injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILES COMMENTS:

LOW LEVEL WATER:

The samples were extracted and analyzed within the CLP SOW holding time. With approval from WHC, the samples were extracted and analyzed without an MS, MSD pair since they did not submit enough sample. All of the QC results were within the limits specified in the EPA CLP SOW

A QC case (01-032) has been created as per WHC, that contains laboratory water that has had the Matrix Spike compounds added. The case will be available at a later time to be added as an addendum to this case.

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS:

SEQUENCE NOTES:

The sequence was started on 12/19/91 and was within the limits specified in the EPA CLP SOW. After the injection made at 21:19 on 12/19/91, the laboratory experienced a power failure. The sequence was resumed with the next injection at 08:41 on 12/20/91 when power was restored. After the injection made at 01:29 on 12/21/91, the auto sampler malfunctioned. Maintenance was performed and the sequence resumed with the next injection made at 09:42 on 12/21/91. The sequence was interrupted after the injection made at 13:18 on 12/21/91 to prep and load additional samples to the sequence. The sequence was resumed with the next injection at 17:23 on 12/21/91.

SAMPLES:

LOW LEVEL WATER:

The samples were extracted and analyzed within the holding times specified in the CLP SOW. With approval from Westinghouse Hanford Company, the samples were extracted and analyzed without an MS, MSD pair since they did not submit enough sample. All of the other QC results were within the limits specified in the EPA CLP SOW.

A QC case (01-032) has been created as per WHC, that contains laboratory water that has had the Matrix Spike compounds added. The case will be available at a later time to be added as an addendum to this case.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this package and on the accompanying data diskette is authorized by the Lab Manager as verified by the following signature.

Dennis D. Wells
Laboratory Manager

9713515.0080

0005

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K14

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	18	
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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	7	J
591-78-6	2-Hexanone	10	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

9713515.0081

0006
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K14

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0082

0007
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K15

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	BJ
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

9713515.0083

0008
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K15

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0084

0009
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K18

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

9713515.0085

0010
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K18

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K20

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	B
67-64-1	Acetone	10	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	7	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	3	J
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	10	U
591-78-6	2-Hexanone	10	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

9713515.0087

0012

EPA SAMPLE NO.

B01DL7

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K20

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0088

0013

EPA SAMPLE NO.

B01DN8

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08F

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K21

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

9713515.0089

0014

EPA SAMPLE NO.

B01DN8

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08F

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K21

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DY5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-10E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K23

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	6	B
67-64-1	Acetone	12	
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	9	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	3	J
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	10	U
591-78-6	2-Hexanone	10	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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DY5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-10E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K23

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0092

0017

EPA SAMPLE NO.

B01DY7

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-11E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K24

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	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	10	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	
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	10	U
591-78-6	2-Hexanone	10	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

9713515.0093

0018

EPA SAMPLE NO.

B01DY7

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-11E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K24

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0094

0019

EPA SAMPLE NO.

B01DY9

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-12D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K25

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	10	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	6	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	4	J
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	10	U
591-78-6	2-Hexanone	10	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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DY9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-12D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K25

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DZ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-13D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K26

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	BJ
67-64-1	Acetone	10	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	4	J
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	4	J
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	10	U
591-78-6	2-Hexanone	10	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

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DZ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-13D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K26

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01F60

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-05A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K19

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	8	B
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01F60

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-05A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K19

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01F61

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-09A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K22

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	7	B
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01F61

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-09A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K22

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0102

0027

EPA SAMPLE NO.

B01DH7

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N05

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N05

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	2	J
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	20	B
218-01-9	Chrysene	10	U
117-84-0	Di-n-octyl Phthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N05

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN CYCLOALKANE	3.20	18	J
2.	UNKNOWN HYDROCARBON	32.86	14	J

9713515.0105

0030

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N06

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N06

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	2	BJ
218-01-9	Chrysene	10	U
117-84-0	Di-n-octyl Phthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N06

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN CYCLOALKANE	3.20	14	J
2.	UNKNOWN HYDROCARBON	40.99	18	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N07

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N07

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	2	BJ
218-01-9	Chrysene	10	U
117-84-0	Di-n-octyl Phthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

9713515.0110

0035

1F

EPA SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N07

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	3.22	14	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N08

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N08

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octyl Phthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N08

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN CYCLOALKANE	3.22	14	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DN8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N09

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

9713515.0115

0040
EPA SAMPLE NO.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B01DN8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N09

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	2	J
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octyl Phthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

EPA SAMPLE NO.

B01DN8

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N09

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN CYCLOALKANE	3.22	14	J

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0118

0043

EPA SAMPLE NO.

B01DJ0

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0119

0044
EPA SAMPLE NO.

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0121

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 0046

B01DN8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0122

0047
EPA SAMPLE NO.

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

B01DY5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-10A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0123

0048

EPA SAMPLE NO.

B01DY7

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-11A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DY9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-12A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

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1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

0050

EPA SAMPLE NO.

B01DZ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-13A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

CASE NARRATIVE

LABORATORY: TMA/ARLI

CASE: 12-015

CONTRACT ID: WESTINGHOUSE HANFORD COMPANY

SDG RECEIPT DATE: December 5, 1991

1.0 DESCRIPTION OF CASE:

Eleven water samples were analyzed for full TCL Organics (Volatiles, Semivolatiles and Pesticide/PCB's) according to the USEPA Contract Laboratory Program (CLP) Statement of Work for Organic Analysis, Revision 2/88.

The samples for Pesticide/PCB and Semivolatile analyses had insufficient sample volume to perform MS and MSD analyses. As per Westinghouse Hanford Company, a QC case (01-032) has been created using laboratory water. This case will be sent as an addendum to this case.

2.0 SAMPLE LIST:

WESTINGHOUSE ID	LAB ID	ANALYSIS REQUESTED	MATRIX
B01DH7	A1-12-015-01A	SV & P	WATER
B01DH7	A1-12-015-01E	V	WATER
B01DJ0	A1-12-015-02A	SV & P	WATER
B01DJ0	A1-12-015-02E	V	WATER
B01DJ3	A1-12-015-03A	SV & P	WATER
B01DJ3	A1-12-015-03E	V	WATER
B01F60	A1-12-015-05A	V	WATER
B01DL7	A1-12-015-06A	SV & P	WATER
B01DL7	A1-12-015-06E	V	WATER
B01DN8	A1-12-015-08A	SV & P	WATER
B01DN8	A1-12-015-08F	V	WATER
B01F61	A1-12-015-09A	V	WATER
B01DY5	A1-12-015-10A	P	WATER
B01DY5	A1-12-015-10E	V	WATER
B01DY7	A1-12-015-11A	P	WATER
B01DY7	A1-12-015-11E	V	WATER
B01DY9	A1-12-015-12A	P	WATER
B01DY9	A1-12-015-12D	V	WATER
B01DZ1	A1-12-015-13A	P	WATER
B01DZ1	A1-12-015-13D	V	WATER

3.0 COMMENTS:

3.1 SHIPPING AND DOCUMENTATION:

All samples were received unbroken and properly documented with the exception of samples B01DH8, B01DJ1, and B01DL8. These samples were listed on WHC Chain of Custody, however, TMA/ARLI did not receive them for volatiles analysis.

3.2 ANALYSIS:

3.2.1 VOLATILE ANALYSIS COMMENTS:

LOW LEVEL WATER :

The samples were analyzed within the CLP SOW holding time. All of the QC results were within the limits specified in the EPA CLP SOW.

TUNES:

All the BFB tunes are injected directly into the GC/MS instrument.

3.2.2 SEMIVOLATILES COMMENTS:

LOW LEVEL WATER:

The samples were extracted and analyzed within the CLP SOW holding time. With approval from WHC, the samples were extracted and analyzed without an MS, MSD pair since they did not submit enough sample. All of the QC results were within the limits specified in the EPA CLP SOW

A QC case (01-032) has been created as per WHC, that contains laboratory water that has had the Matrix Spike compounds added. The case will be available at a later time to be added as an addendum to this case.

3.2.3 PESTICIDE/PCB ANALYSIS COMMENTS:

SEQUENCE NOTES:

The sequence was started on 12/19/91 and was within the limits specified in the EPA CLP SOW. After the injection made at 21:19 on 12/19/91, the laboratory experienced a power failure. The sequence was resumed with the next injection at 08:41 on 12/20/91 when power was restored. After the injection made at 01:29 on 12/21/91, the auto sampler malfunctioned. Maintenance was performed and the sequence resumed with the next injection made at 09:42 on 12/21/91. The sequence was interrupted after the injection made at 13:18 on 12/21/91 to prep and load additional samples to the sequence. The sequence was resumed with the next injection at 17:23 on 12/21/91.

SAMPLES:

LOW LEVEL WATER:

The samples were extracted and analyzed within the holding times specified in the CLP SOW. With approval from Westinghouse Hanford Company, the samples were extracted and analyzed without an MS, MSD pair since they did not submit enough sample. All of the other QC results were within the limits specified in the EPA CLP SOW.

A QC case (01-032) has been created as per WHC, that contains laboratory water that has had the Matrix Spike compounds added. The case will be available at a later time to be added as an addendum to this case.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data in this package and on the accompanying data diskette is authorized by the Lab Manager as verified by the following signature.

Dennis D. Wells
Laboratory Manager

9713515.0129

TMA
Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200

JAN 1992
RECEIVED
OSM
DMO

Federal Express 4009270226
January 27, 1992

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Nine (9) water samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 07, 1991 from Westinghouse Hanford Company. The samples were analyzed for the USEPA CLP metals. The analysis was performed under Skinner and Sherman work order 9112046.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

Discussion
All quality control requirements were met for the samples with the following exceptions:

The selenium and thallium digestion spike recoveries exceeded the control limit requirements.

The zinc duplicates exceeded the control limit requirements.

Please feel free to call if there are any questions concerning the data package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

David N. Peterson
Assistant Laboratory Manager

9713515.0150 1.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B01DH8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0103

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-01S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	27.40	B		P
7440-36-0	Antimony	15.50	B		P
7440-38-2	Arsenic	6.00	B		F
7440-39-3	Barium	37.10	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	38400.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	23.80	B		P
7439-92-1	Lead	2.80	B		F
7439-95-4	Magnesium	8670.00			P
7439-96-5	Manganese	45.60			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	5050.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	13600.00			P
7440-28-0	Thallium	2.30	B	WN	F
7440-62-2	Vanadium	8.10	B		P
7440-66-6	Zinc	32.40		*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DJ1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-02S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	30.60	B		P
7440-36-0	Antimony	14.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	42.50	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	19000.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	211.00			P
7439-92-1	Lead	5.20			F
7439-95-4	Magnesium	6720.00			P
7439-96-5	Manganese	97.40			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	5620.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	26300.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	2.00	U		P
7440-66-6	Zinc	5.70	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9213515.0132 1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DJ4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-03C

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	51.20	B		P
7440-36-0	Antimony	26.90	B		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	99.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	21900.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	284.00			P
7439-92-1	Lead	2.50	B		F
7439-95-4	Magnesium	8580.00			P
7439-96-5	Manganese	86.70			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	6620.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	40800.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	2.00	U		P
7440-66-6	Zinc	7.80	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0133 1.

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DL8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-045

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19.40	B		P
7440-36-0	Antimony	14.00	U		P
7440-38-2	Arsenic	2.00	B	W	F
7440-39-3	Barium	50.70	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	39600.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	110.00			P
7439-92-1	Lead	5.80			F
7439-95-4	Magnesium	7450.00			P
7439-96-5	Manganese	1.60	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	4160.00	B		P
7782-49-2	Selenium	4.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	14700.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	3.80	B		P
7440-66-6	Zinc	13.10	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0134

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DN9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-05S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	38.80	B		P
7440-36-0	Antimony	25.60	B		P
7440-38-2	Arsenic	4.10	B	W	F
7440-39-3	Barium	55.70	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	60800.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	47.00	B		P
7439-92-1	Lead	4.90			F
7439-95-4	Magnesium	12400.00			P
7439-96-5	Manganese	1.20	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	6570.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	24200.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	6.90	B		P
7440-66-6	Zinc	8.40	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

921515.0155 1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DY6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-06S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/l or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	69.10	B		P
7440-36-0	Antimony	14.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	50.40	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.50	B		P
7440-70-2	Calcium	34200.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	94.10	B		P
7439-92-1	Lead	1.00	U		F
7439-95-4	Magnesium	6730.00			P
7439-96-5	Manganese	1.90	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	3800.00	B		P
7782-49-2	Selenium	20.00	U	MN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	12400.00			P
7440-28-0	Thallium	10.00	U	WN	F
7440-62-2	Vanadium	3.10	B		P
7440-66-6	Zinc	14.10	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9215515.0136 1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DY8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-079

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29.50	B		P
7440-36-0	Antimony	16.20	B		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	39.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	40600.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	4.20	B		P
7439-89-6	Iron	27.60	B		P
7439-92-1	Lead	1.20	B	W	F
7439-95-4	Magnesium	7870.00			P
7439-96-5	Manganese	2.50	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	4310.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	16800.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	5.00	B		P
7440-66-6	Zinc	6.80	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9135156157 1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01D20

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINNER Case No.: V112034 SAS No.: SDG No.: B01DHR

Matrix (soil/water): WATER Lab Sample ID: 12046-005

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29.50	B		P
7440-36-0	Antimony	14.00	U		P
7440-38-2	Arsenic	3.90	B	W	F
7440-39-3	Barium	35.40	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	40300.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	18.80	B		P
7439-92-1	Lead	1.90	B		F
7439-95-4	Magnesium	8000.00			P
7439-96-5	Manganese	1.00	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	4780.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	17600.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	8.50	B		P
7440-66-6	Zinc	7.30	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DZ2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-09S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31.90	B		P
7440-36-0	Antimony	14.80	B		P
7440-38-2	Arsenic	2.40	B	W	F
7440-39-3	Barium	34.80	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	40600.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	30.60	B		P
7439-92-1	Lead	1.00	U		F
7439-95-4	Magnesium	8110.00			P
7439-96-5	Manganese	1.00	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	4720.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	17600.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	7.30	B		P
7440-66-6	Zinc	7.80	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

010

9713515.0139

TMA
Thermo Analytical Inc.

Skinner & Sherman Laboratories Inc.
300 Second Avenue
Post Office Box 521
Waltham, MA 02254-0521
(617) 890-7200

JAN 1992
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Federal Express 4009270171
January 25, 1992

TMA/NORCAL
2030 Wright Avenue
Richmond, CA 94804
Attention: Dan Stuermer

Quality Control Narrative

Scope
Nine (9) water samples were submitted to TMA/Skinner & Sherman Laboratories, Inc. on December 07, 1991 from Westinghouse Hanford Company. The samples were analyzed for the USEPA CLP metals. Five of the samples were analyzed for cyanide also. The analysis was performed under Skinner and Sherman work order 9112045.

Methodology
The samples were prepared, analyzed and reported in accordance with the USEPA Contract Laboratory Program Statement of Work 7/88 (CLP SOW788).

Discussion
All quality control requirements were met for the samples with the following exceptions:

The mercury, thallium, and selenium digestion spike recoveries exceeded the control limit requirements.

Please feel free to call if there are any questions concerning the data package.

Respectfully submitted,

TMA/SKINNER & SHERMAN LABORATORIES, INC.

David N. Peterson
Assistant Laboratory Manager

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DH7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-01S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	324.00			P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	7.50	B	S	F
7440-39-3	Barium	39.40	B		P
7440-41-7	Beryllium	1.40	B		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	40100.00			P
7440-47-3	Chromium	7.50	B		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	490.00			P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	8780.00			P
7439-96-5	Manganese	57.10			P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	5020.00			P
7782-49-2	Selenium	4.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	13400.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	11.30	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DJ0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-02S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	33.40	B		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	43.20	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	19200.00			P
7440-47-3	Chromium	11.20			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	273.00			P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	6810.00			P
7439-96-5	Manganese	105.00			P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	5750.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	26700.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	5.00	U		P
7440-66-6	Zinc	7.00	U		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DJ3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-03S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1570.00			P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	111.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	22400.00			P
7440-47-3	Chromium	65.60			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	2380.00			P
7439-92-1	Lead	3.40			F
7439-95-4	Magnesium	8710.00			P
7439-96-5	Manganese	114.00			P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	27.40	B		P
7440-09-7	Potassium	6170.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	39900.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	5.20	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DL7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-04S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31.00	U		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	50.60	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	39100.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	83.50	B		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	7330.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	4210.00	B		P
7782-49-2	Selenium	20.00	U	N	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	14500.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	5.30	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9713515.0144

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B01DN8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-05S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31.00	U		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	4.40	B	W	F
7440-39-3	Barium	60.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	60400.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	12.00	U		P
7439-92-1	Lead	2.60	B		F
7439-95-4	Magnesium	12300.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	6340.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	23800.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	8.20	B		P
7440-66-6	Zinc	12.50	B		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0045

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DY5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-06S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	38.70	B		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	50.60	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	32800.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	70.30	B		P
7439-92-1	Lead	3.10			F
7439-95-4	Magnesium	6410.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	20.00	B		P
7440-09-7	Potassium	3660.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	12300.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	5.90	B		P
7440-66-6	Zinc	18.80	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DY7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-07S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	61.20	B		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	39.40	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	39800.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	121.00			P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	7760.00			P
7439-96-5	Manganese	2.70	B		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	4450.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	16600.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	7.10	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DY9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-08S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31.00	U		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.20	B	W	F
7440-39-3	Barium	31.90	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	38600.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	12.00	U		P
7439-92-1	Lead	2.10	B		F
7439-95-4	Magnesium	7640.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	4710.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	17000.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	10.60	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DZ1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-09S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	60.00	B		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.30	B	W	F
7440-39-3	Barium	39.40	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	39100.00			P
7440-47-3	Chromium	28.10			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	208.00			P
7439-92-1	Lead	2.10	B		F
7439-95-4	Magnesium	7850.00			P
7439-96-5	Manganese	5.60	B		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	17.00	B		P
7440-09-7	Potassium	4560.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	17200.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	7.80	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0149

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P. O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 Fax No. (510) 235-0438

JUL 1992
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July 13, 1992

SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N1-12-028-9573

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the gross alpha, gross beta, ^{3}H, ^{90}Sr, ^{99}Tc, ^{129}I, isotopic uranium, isotopic plutonium, and gamma scan results for the water samples from 300-FF-5 Location, we received 5 December 1991.

Please call if you have any questions concerning this data.

Sincerely,

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Enclosures: Sections 1 through 14
Appendices

MS
8/2/96

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ATTACHMENT 1 DATA TABLE

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DH7 (water)	1	Gross Alpha	(-0.0392 ± 1.81)	E+00
		Gross Beta	(0.794 ± 1.62)	E+00
		^{3}H	(-1.18 ± 1.15)	E+02
		^{234}U	(8.32 ± 0.918)	E-01
		^{235}U	(5.22 ± 2.50)	E-02
		^{238}U	(7.77 ± 0.873)	E-01
		Gamma Scan:		
		^{40}K	<8.441	E+00
		^{51}Cr	<5.470	E+02
		^{60}Co	<1.172	E+00
		^{65}Zn	<2.679	E+00
		^{134}Cs	<9.344	E-01
		^{137}Cs	<6.884	E-01
		^{226}Ra	<1.477	E+00
		^{228}Th	<1.412	E+00
		^{232}Th	<3.181	E+00
B01DJ0 (water)	2	Gross Alpha	(-0.0710 ± 1.12)	E+00
		Gross Beta	(3.83 ± 1.56)	E+00
		^{3}H	(0.355 ± 1.22)	E+02
		^{90}Sr	(0.0316 ± 1.65)	E+00
		^{99}Tc	(9.96 ± 5.20)	E+00
		^{129}I	(1.43 ± 2.63)	E+00
		^{234}U	(2.30 ± 2.05)	E-02
		^{235}U	(-0.620 ± 1.24)	E-02
		^{238}U	(0.768 ± 1.02)	E-02
		^{238}Pu	(1.82 ± 7.28)	E-03
		^{239}Pu	(0 ± 3.63)	E-03
		^{241}Pu	(-1.40 ± 0.0728)	E+00
		Gamma Scan:		
		^{40}K	<2.016	E+02
		^{51}Cr	<7.086	E+03
		^{60}Co	<1.787	E+01
		^{65}Zn	<5.339	E+01
		^{134}Cs	<1.689	E+01
		^{137}Cs	<1.500	E+01
		^{226}Ra	<2.880	E+01
		^{228}Th	<2.432	E+01
		^{232}Th	<5.446	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DJ3 (water)	3	Gross Alpha	(-0.520 ± 2.09)	E+00
		Gross Beta	(6.02 ± 1.48)	E+00
		^{3}H	(-0.279 ± 1.14)	E+02
		^{90}Sr	(0 ± 1.46)	E+00
		^{99}Tc	(2.83 ± 2.77)	E+00
		^{129}I	(0.732 ± 3.08)	E+00
		^{234}U	(5.86 ± 3.71)	E-02
		^{235}U	(-0.746 ± 1.49)	E-02
		^{238}U	(5.86 ± 3.10)	E-02
		^{238}Pu	(2.22 ± 8.86)	E-03
		^{239}Pu	(2.21 ± 8.83)	E-03
		^{241}Pu	(0.163 ± 0.652)	E+00
		Gamma Scan:		
		^{40}K	<2.304	E+02
		^{51}Cr	<6.769	E+03
		^{60}Co	<1.230	E+01
		^{65}Zn	<4.039	E+01
		^{134}Cs	<1.399	E+01
		^{137}Cs	<1.310	E+01
		^{226}Ra	<2.315	E+01
		^{228}Th	<2.289	E+01
		^{232}Th	<5.239	E+01
B01DL7 (water)	4	Gross Alpha	(27.8 ± 4.60)	E+00
		Gross Beta	(29.1 ± 2.37)	E+00
		^{3}H	(5.03 ± 0.297)	E+03
		^{90}Sr	(0.257 ± 0.135)	E+00
		^{99}Tc	(7.71 ± 3.49)	E+00
		^{129}I	(0.936 ± 1.46)	E+00
		^{234}U	(2.06 ± 0.111)	E+01
		^{235}U	(1.47 ± 0.153)	E+00
		^{238}U	(1.99 ± 0.107)	E+01
		^{238}Pu	(-2.41 ± 9.64)	E-03
		^{239}Pu	(2.40 ± 4.80)	E-03
		^{241}Pu	(0.387 ± 0.774)	E+00
		Gamma Scan:		
		^{40}K	<1.273	E+02
		^{51}Cr	<3.970	E+03
		^{60}Co	<1.016	E+01
		^{65}Zn	<1.847	E+01
		^{134}Cs	<7.909	E+00
		^{137}Cs	<7.581	E+00
		^{226}Ra	<1.224	E+01
		^{228}Th	<2.755	E+01
		^{232}Th	<3.038	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DN8 (water)	5	Gross Alpha	(2.56 ± 2.54)	E+00
		Gross Beta	(34.1 ± 2.49)	E+00
		^{3}H	(0.310 ± 1.19)	E+02
		^{90}Sr	(0 ± 1.56)	E+00
		^{99}Tc	(6.27 ± 0.784)	E+01
		^{129}I	(-1.03 ± 3.18)	E+00
		^{234}U	(2.30 ± 0.215)	E+00
		^{235}U	(1.18 ± 0.494)	E-01
		^{238}U	(2.10 ± 0.203)	E+00
		^{238}Pu	(-1.75 ± 3.51)	E-03
		^{239}Pu	(3.49 ± 3.50)	E-03
		^{241}Pu	(0.848 ± 0.848)	E+00
		Gamma Scan:		
		^{40}K	<1.431	E+02
		^{51}Cr	<4.393	E+03
		^{60}Co	<9.150	E+00
		^{65}Zn	<2.642	E+01
		^{134}Cs	<9.593	E+00
		^{137}Cs	<7.911	E+00
		^{226}Ra	<1.361	E+01
		^{228}Th	<1.420	E+01
		^{232}Th	<3.669	E+01
B01DY5 (water)	6	Gross Alpha	(8.83 ± 1.69)	E+00
		Gross Beta	(12.2 ± 1.38)	E+00
		^{90}Sr	(0.253 ± 1.27)	E+00
		^{234}U	(6.47 ± 0.545)	E+00
		^{235}U	(5.39 ± 1.18)	E-01
		^{238}U	(5.86 ± 0.503)	E+00
		Gamma Scan:		
		^{40}K	<7.885	E+01
		^{51}Cr	<3.785	E+03
		^{60}Co	<7.599	E+00
		^{65}Zn	<1.853	E+01
		^{134}Cs	<7.881	E+00
		^{137}Cs	<6.583	E+00
		^{226}Ra	<1.347	E+01
		^{228}Th	<1.431	E+01
		^{232}Th	<2.804	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page four)
Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DY7 (water)	7	Gross Alpha	(20.0 ± 2.75)	E+00
		Gross Beta	(30.9 ± 1.76)	E+00
		^{90}Sr	(-1.21 ± 1.71)	E+00
		^{234}U	(1.12 ± 0.0913)	E+01
		^{235}U	(7.62 ± 1.50)	E+01
		^{238}U	(1.14 ± 0.0930)	E+01
		Gamma Scan:		
		^{40}K	<9.827	E+01
		^{51}Cr	<6.407	E+03
		^{60}Co	<1.848	E+01
		^{65}Zn	<3.957	E+01
		^{134}Cs	<1.425	E+01
		^{137}Cs	<1.160	E+01
		^{226}Ra	<2.174	E+01
		^{228}Th	<3.396	E+01
		^{232}Th	<5.205	E+01
B01DY9 (water)	8	Gross Alpha	(14.3 ± 2.75)	E+00
		Gross Beta	(10.7 ± 1.37)	E+00
		^{90}Sr	(-2.29 ± 2.81)	E+00
		^{234}U	(6.82 ± 0.607)	E+00
		^{235}U	(3.41 ± 0.947)	E-01
		^{238}U	(6.71 ± 0.594)	E+00
		Gamma Scan:		
		^{40}K	<2.561	E+02
		^{51}Cr	<7.101	E+03
		^{60}Co	<1.652	E+01
		^{65}Zn	<4.142	E+01
		^{134}Cs	<1.720	E+01
		^{137}Cs	<1.379	E+01
		^{226}Ra	<2.469	E+01
		^{228}Th	<2.371	E+01
		^{232}Th	<5.549	E+01
B01DZ1 (water)	9	Gross Alpha	(6.16 ± 1.60)	E+00
		Gross Beta	(9.43 ± 1.46)	E+00
		^{90}Sr	(0.278 ± 0.368)	E+00
		^{234}U	(5.86 ± 0.529)	E+00
		^{235}U	(3.53 ± 1.00)	E-01
		^{238}U	(5.85 ± 0.522)	E+00
		Gamma Scan:		
		^{40}K	<9.270	E+01
		^{51}Cr	<4.070	E+03
		^{60}Co	<1.316	E+01
		^{65}Zn	<2.674	E+01
		^{134}Cs	<9.978	E+00
		^{137}Cs	<8.151	E+00
		^{226}Ra	<1.439	E+01
		^{228}Th	<2.867	E+01
		^{232}Th	<3.281	E+01

CASE NARRATIVE

1. Project 300-FF-5 water samples (TMA/Norcal Group Nos. 9573, 7003, and 9576) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B01DH7	9573-1	B01DL1	7003-6
B01DJ0	9573-2	B01F07	7003-7
B01DJ3	9573-3	B01DM9	7003-8
B01DL7	9573-4	B01DN5	7003-9
B01DN8	9573-5	B01DM6	9576-1
B01DY5	9573-6	B01DP1	9576-2
B01DY7	9573-7	B01DP4	9576-3
B01DY9	9573-8	B01DS8	9576-4
B01DZ1	9573-9	B01DZ3	9576-5
B01DT7	7003-1	B01DT1	9576-6
B01DW6	7003-2	B01DT4	9576-7
B01DX0	7003-3	B01DX3	9576-8
B01DX9	7003-4	B01DZ9	9576-9
B01F15	7003-5	B01F01	9576-10
		B01F03	9576-11
		B01DK8	9576-12

2. The analysis reported are:

WATER

Analyte Sample #	Group # & Sample #	Group # & Sample #	Group # & Sample #
Gross α & β	9573-1-9	7003-1-9	9576-1-12
^{3}H	9573-1,2,3,4, & 5	7003-1,2,3,4,6,8, & 9	9576-1 thru 9, & 11
^{90}Sr	9573-2,3,4,5,6,7,8,&9	7003-1-9	9576-1-12
^{99}Tc	9573-2,3, 4, & 5	7003-1,2,3,4,6,8, & 9	9576-1 thru 9, & 11
^{129}I	9573-2,3, 4, & 5	7003-1,2,3,4,6,8, & 9	9576-1 thru 9, & 11
Isotopic U	9573-1-9	7003-1-9	9576-1-12
Isotopic Pu	9573-2,3, 4, & 5	7003-1,3,4,6,8, & 9	9576-1 thru 9, & 11
^{241}Pu	9573-2,3, 4, & 5	7003-1,3,4,6,8, & 9	9576-1 thru 9, & 11
Gamma Scan	9573-1-9	7003-1-9	9576-1-12

3. Results are reported pCi/L with 2 σ errors.

4. The QC samples consisting of a spike, a laboratory control sample, and a replicate were processed with each batch as shown on Table 1.

TABLE 1

Preparation Batch Samples Processed	Data Package
9573-1 through 9	- WATER
7003-1 through 9	- WATER
9576-1 through 12	- WATER

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9573-34 (QC 7514)	Spike	Gross α,β	X
9573-35 (QC 7515)	Spike	Gross α,β	X
7003-16 (QC 7544)	Spike	Gross α,β	X
9573-36 (QC 7516)	LCS	Gross α,β	X
9573-37 (QC 7517)	LCS	Gross α,β	X
7003-17 (QC 7545)	LCS	Gross α,β	X
9573-38 (QC 7518)	Replicate	Gross α,β	X
9573-39 (QC 7519)	Replicate	Gross α,β	X
7003-18 (QC 7546)	Replicate	Gross α,β	X
9573-52 (QC 7532)	Spike	^{3}H	X
9573-53 (QC 7533)	Spike	^{3}H	X
9573-54 (QC 7534)	LCS	^{3}H	X
9573-55 (QC 7535)	LCS	^{3}H	X
9573-56 (QC 7536)	Replicate	^{3}H	X
9573-57 (QC 7537)	Replicate	^{3}H	X
9573-10 (QC 7508)	Spike	^{90}Sr	X
9573-11 (QC 7509)	Spike	^{90}Sr	X
7003-13 (QC 7541)	Spike	^{90}Sr	X
9573-12 (QC 7492)	LCS	^{90}Sr	X
9574-13 (QC 7493)	LCS	^{90}Sr	X
7003-14 (QC 7542)	LCS	^{90}Sr	X
9573-14 (QC 7494)	Replicate	^{90}Sr	X
9573-15 (QC 7495)	Replicate	^{90}Sr	X
7003-15 (QC 7543)	Replicate	^{90}Sr	X
9573-22 (QC 7502)	Spike	^{99}Tc	X
9573-23 (QC 7503)	Spike	^{99}Tc	X
9573-24 (QC 7504)	LCS	^{99}Tc	X
9573-25 (QC 7505)	LCS	^{99}Tc	X
9573-26 (QC 7506)	Replicate	^{99}Tc	X
9573-27 (QC 7507)	Replicate	^{99}Tc	X
9573-40 (QC 7520)	Spike	^{129}I	X
9573-41 (QC 7521)	Spike	^{129}I	X
9573-42 (QC 7522)	LCS	^{129}I	X
9573-43 (QC 7523)	LCS	^{129}I	X
9573-44 (QC 7524)	Replicate	^{129}I	X
9573-45 (QC 7525)	Replicate	^{129}I	X

QC SAMPLES PROCESSED: (cont'd.)

Sample I.D.	Type	Analyses	Reported with Data Package
9573-16 (QC 7496)	Spike	Isotopic U	X
9573-17 (QC 7497)	Spike	Isotopic U	X
7003-10 (QC 7538)	Spike	Isotopic U	X
9573-18 (QC 7498)	LCS	Isotopic U	X
9573-19 (QC 7499)	LCS	Isotopic U	X
7003-11 (QC 7539)	LCS	Isotopic U	X
9573-21 (QC 7501)	Replicate	Isotopic U	X
7003-12 (QC 7540)	Replicate	Isotopic U	X
9573-10 (QC 7490)	Spike	Isotopic Pu	X
9573-11 (QC 7491)	Spike	Isotopic Pu	X
9573-58 (QC 7667)	Spike	Isotopic Pu	X
9573-12 (QC 7492)	LCS	Isotopic Pu	X
9573-59 (QC 7668)	LCS	Isotopic Pu	X
9573-14 (QC 7494)	Replicate	Isotopic Pu	X
9573-15 (QC 7495)	Replicate	Isotopic Pu	X
9573-60 (QC 7669)	Replicate	Isotopic Pu	X
9573-46 (QC 7526)	Spike	Gamma Scan	X
9573-47 (QC 7527)	Spike	Gamma Scan	X
7003-19 (QC 7547)	Spike	Gamma Scan	X
9573-48 (QC 7528)	LCS	Gamma Scan	X
9573-49 (QC 7529)	LCS	Gamma Scan	X
7003-20 (QC 7548)	LCS	Gamma Scan	X
9573-50 (QC 7530)	Replicate	Gamma Scan	X
9573-51 (QC 7531)	Replicate	Gamma Scan	X
7003-21 (QC 7549)	Replicate	Gamma Scan	X

6. Analysis, reanalysis, and reworks, etc.

Gross Alpha and Gross Beta Analyses: The results of the spike, the laboratory control sample were satisfactory, except for gross alpha spikes. The found/added ratio for gross alpha spikes were 0.76 ± 0.08 and 0.78 ± 0.05. No abnormalties were encountered.

Strontium Analyses: The average yield for 29 analyses was 60%. The lowest yield was 25% and the highest was 83%. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered. The spike and the LCS were switched in the Lab and the results of the switched samples were satisfactory.

Isotopic Pu Analyses: The average yield for 20 analyses was 81%. The lowest yield was 34% and the highest was 103%. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Technetium Analyses: The average yield for 21 analyses was 47%. The lowest yield was 14% and the highest was 79%. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Gamma Scan Analyses: The spike sample processed had ^{60}Co and ^{137}Cs activities and the found/added ratio of the spike look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Ttitium Analyses: The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Isotopic Uranium Analyses: The average yield for 30 analyses was 61%. The lowest yield was 38% and the highest was 89%. The results of one spike, the laboratory control sample and the replicate were satisfactory. No abnormalities were encountered. The found/added ratio for ^{234}U and ^{238}U of the second spike were 0.69 ± 0.06 and 0.67 ± 0.06.

Iodine-129 Analyses: The average yield for 21 analyses was 62%. The lowest yield was 40% and the highest was 72%. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

9713515.0158

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Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-2-91

Ice Chest No. FIFE

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 247425882-5 ~~247425598-14~~ PMB 12/4/91

Offsite Property No. W92-0-0035-49

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PMB 12/3/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DH7

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DH8

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: LD Walker L.D. Walker	Received by: PH Butcher PH Butcher	Date/Time: 12/3/91 0700
Relinquished by: PH Butcher PH Butcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 9713515.0159

SAMPLE ANALYSIS REQUEST

TASK # 91-097

PART I: FIELD SECTION

Collector LD WALKER/KD LEE Date Sampled _____ Time _____ hours

Company Contact PH BUTCHER Telephone (509) ~~376-6465~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01DH7	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRTIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129
			Tc-99, U-ISOTOPIC (HNO3)
B01DH8	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
	3, 40ml, Ag	W	CLP-VOA

Field Information** BOL#: ~~2474853814~~ PHB 12/4/91 2474859882-5 OPC#: W92-0-0035 #49

Special Handling and/or Storage N/A

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0160

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Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/2/91

Ice Chest No. #10

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 247485282-5 ~~247485281-4~~ DHB 12/4/91

Offsite Property No. W92- 0-0035-48

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PHB 12/5/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DJ0

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DJ1

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: L.D. Walker, L.D. Walker	Received by: P H Butcher P H Butcher	Date/Time: 12/3/91 0700
Relinquished by: P H Butcher P H Butcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713515.0161

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

TASK # 91-097

2

PART I: FIELD SECTION

Collector LD WALKER/KD LEE Date Sampled 12/2/91 Time 1245 hours

Company Contact PH BUTCHER Telephone (509) ~~376-6165~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01DJ0	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRTIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129
			Tc-99, U-ISOTOPIC (HNO3)
B01DJ1	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
	3, 40ml, Ag	W	CLP-VOA

Field Information** BOL#: ~~PHB~~ ~~247485881-4~~ OPC#: W97-0-0035-48
247435282-5 PHB 12/4/91

Special Handling and/or Storage N/A

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.
**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0162

2

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/2/91

Ice Chest No. SMC-16

Field Logbook No. EFL-1004 Pg.

Bill of Lading/Airbill No. ~~2474852814~~ 2474852272-5 PHB 12/4/91

Offsite Property No. W92-0-0035-48

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PHB 12/7/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DJ3

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DJ4

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

B01F60 3, 40ml, G, WATER, CLP-VOA

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: Kirby R. Lee Kirby Lee	Received by: PH Butcher PH Butcher	Date/Time: 12/3/91 12/2/91 0700
Relinquished by: PH Butcher PH Butcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713515.0163

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

TASK # 91-097

2

PART I: FIELD SECTION

Collector LD WALKER/KD LEE Date Sampled 2/8/91 Time 0948 hours

Company Contact PH BUTCHER Telephone (509) ~~376-6165~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01DJ3	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRTIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129
			Tc-99, U-ISOTOPIC (HNO3)
B01DJ4	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
B01F60	3, 40ml, Ag	W	CLP-VOA

Field Information** BOL#: W92-0-0035-48 OPC#: ~~247405381-4~~ 247425282-5 DAC 12/9/91

Special Handling and/or Storage N/A

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0164

2c

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-3-91

Ice Chest No. Delta-2

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 2474235889-5

Offsite Property No. W92-0-0035-52

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PHB 12/4/91

Possible Sample Hazards/Remarks N/A

Sample Identification

BO 1DL7

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

BO 1DL8

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: L.D. Walker	Received by: PHButcher	Date/Time: 12/4/91 0800
Relinquished by: PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713515.0165

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

TASK # 91-097

2

PART I: FIELD SECTION

Collector LD WALKER/KD LEE Date Sampled 12/3/91 Time 1145 hours

Company Contact PH BUTCHER Telephone (509) ~~376-6165~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01DL7	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRTIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129
			Tc-99, U-ISOTOPIC (HNO3)
B01DL8	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
	3, 40ml, Ag	W	CLP-VOA

Field Information** BOL#: 247425282-5 OPC#: W92-0-0035-52

Special Handling and/or Storage N/A

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0166

2

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/3/91

Ice Chest No. #64

Field Logbook No.

Bill of Lading/Airbill No. 247435882.5

Offsite Property No. W92- 0-0035-52

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA 12/7/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DN8

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DN9
~~B01DN8~~
PHB 12/2/91 1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

B01F61, 3, 40ml, G, water, CLP-VOA

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: Kirby A. Lee K.D. Lee	Received by: PHButcher PHButcher	Date/Time: 12/4/91 0800 12/3/91 1500
Relinquished by: PHButcher PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713515.0167

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

TASK # 91-097

3

PART I: FIELD SECTION

Collector LD WALKER/KD LEE Date Sampled 12/3/91 Time 0807 hours

Company Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01DN8	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRTIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129
			Tc-99, U-ISOTOPIC (HNO3)
B01DN9	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
B01F61	3, 40ml, Ag	W	CLP-VOA

Field Information** BOL#: 247435282-5 OPC#: W92-0-0035-52

Special Handling and/or Storage N/A

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0168

3

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/3/91

Ice Chest No. Happy

Field Logbook No. EFL-1006 pg 2

Bill of Lading/Airbill No. 34748583-5

Offsite Property No. W92- 0-0035-50

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DY5

- 1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
- 3, 40ml, aG, WATER, CLP-VOA
- LW 12-3-91 1 · ~~3~~, 1L, aG, WATER, CLP-PEST/PCB's
- 1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
- 1, 250ml, P, WATER, AMMONIA (H2SO4)
- 1, 125ml, P, WATER, pH
- 2, 4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238, Co-60, Cs-137 (HNO3) LW 12-3-91

B01DY6

1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: Kirby D. Lee K.D. Lee	Received by: PHButcher PHButcher	Date/Time: 12/4/91 0700 12/3/91 1510
Relinquished by: PHButcher PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9213515.0169

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

Task #: 91-097

PART I: FIELD SECTION

Collector: RD Lee / LD Walker Date Sampled: 12/3/91 Time: 1047 hours

Company Contact: ~~B H Ford~~ PH Butcher Telephone: (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~BCG~~ BOIDY5	1, 1L, P	W	ICP/AA Metals (HNO_3) Unfiltered
~~BCG~~	3, 40ml, aG	W	CLP VOA
	1, 1L, aG	W	CLP. Pest/ PCB
	1, 500ml, P	W	Anions (F, NO_2, NO_3) ($ZnAC+NaO$)
	1, 1250ml, P	W	Ammonia (H_2SO_4)
	1, 125ml, P	W	pH
	2, 4L, P	W	Gross Alpha/Beta, Sr-90, Pu-235, Pu-238, Co-60, Cs-137 (HNO_3)
BOIDY6	1, 1L, P	W	ICP/AA Metals (HNO_3) Filtered

Field Information**: BOL # 247425282-5 DPC # W92-0-0035-50

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by: Kermit Blum Title: Sample Control Supervisor Date: 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

A 5000 405 (05/90)

9713515.0170

3E

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-3-91

Ice Chest No. SML-31

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 247425880-5

Offsite Property No. W92-0-0035-50

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DY7

1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
LW 12-3-91 1 ~~3,~~ 1L, aG, WATER, CLP-PEST/PCB's
1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
1, 250ml, P, WATER, AMMONIA (H2SO4)
1, 125ml, P, WATER, pH
LW 12-3-91 2,4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238, Co-60, Cs-137 (HNO3)

B01DY8

1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: L.D. Walker L.D. Walker	Received by: PH Butcher PH Butcher	Date/Time: 12/4/91 0800
Relinquished by: PH Butcher PH Butcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713515.0171

36

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST Task # 91-097

PART I: FIELD SECTION

Collector KD Lee / LD Walker Date Sampled 12-3-91 Time 1245 hours

Company Contact ~~B. H. Ford~~ PHEitcher Telephone (509) 376-~~6465~~ 5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~B00~~ B01DY7	1, 1L, P	W	ICP/AA Metals (HNO_3) Unfiltered
~~B00~~	3, 40ml aG	W	CLP VOA
	1, 1L, aG	W	CLP-Pest/PCB
	1, 500ml P	W	Anions (F, NO_2, NO_3) ($ZnAC+NaOH$)
	1, 1250ml, P	W	Ammonia (H_2SO_4)
	1, 125ml, P	W	pH
	2, 4L P	W	Gross Alpha/Beta, Sr-90, Pu-235, Pu-238, Co-60, Cs-137 (HNO_3)
B01DY8	1, 1L, P	W	ICP/AA Metals (HNO_3) Filtered

Field Information** GOL # 247425282-5 OPC # W92-0-0035-50

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

9713515.0172

3

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-3-91

Ice Chest No. SML-34

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 247485282-5

Offsite Property No. W92-0-0035-51

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DY9

1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
LW 12-3-91 1 ~~3~~, 1L, aG, WATER, CLP-PEST/PCB's
1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
1, 250ml, P, WATER, AMMONIA (H2SO4)
1, 125ml, P, WATER, pH
2, 4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238,
LW 12-3-91 Co-60, Cs-137 (HNO3)

B01DZ0

1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: L.D. Walker L.D. Walker	Received by: P H Butcher P H Butcher	Date/Time: 12/4/91 0800
Relinquished by: P H Butcher P H Butcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

3C

Westinghouse Hanford Company 9113515.0173

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD Lee / LD Walker Date Sampled 12/3/91 Time 0855 hours

Company Contact ~~R. H. Ford~~ PH Butcher Telephone (509)

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~B00~~ B01DY9	1, 1L, P	W	ICP/AA Metals (HNO_3) Unfiltered
~~B00~~	3, 40ml aG	W	CLP VOA
	1, 1L, aG	W	CLP - Pest/ PCB
	1, 500ml P	W	Anions (F, NO_2, NO_3) ($ZnAC + NaO$)
	1, 1250ml, P	W	Ammonia (H_2SO_4)
	1, 125ml, P	W	pH
	2, 4L P	W	Gross Alpha/Beta, Sr-90, Pu-235,
			Pu-238, Co-60, Cs-137 (HNO_3)
B01DZ0	1, 1L, P	W	ICP/AA Metals (HNO_3) Filtered

Field Information** BOL # 247425282-5 DPC # W92-0-0035-51

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

A 5000 ANF 105.00

9713515.0174

3C

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/3/91

Ice Chest No. Sneezy-1

Field Logbook No. EFL-1000

Bill of Lading/Airbill No. 2474252882-5

Offsite Property No. W92-0-0035-51

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DZ1

1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
LW 12-3-91 1 ~~3~~, 1L, aG, WATER, CLP-PEST/PCB's
1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
1, 250ml, P, WATER, AMMONIA (H2SO4)
1, 125ml, P, WATER, pH
2, 4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238,
LW 12-3-91 Co-60, Cs-137 (HNO3)

B01DZ2

1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: K.N. Lee	Received by: PHButcher	Date/Time: 12/4/91 0800 12/3/91
Relinquished by: PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

4(

Westinghouse Hanford Company 9713515.0175

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD Lee / LD Walker Date Sampled 12/3/91 Time 1405 hours

Company Contact ~~B. H. Ford~~ PH Butcher Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~B00~~ B01DZ1	1, 1L, P	W	ICP/AA Metals (HNO_3) Unfiltered
~~B00~~	3, 40ml aG	W	CLP VOA
	1, 1L, aG	W	CLP. Pest/ PCB
	1, 500ml P	W	Anions (F, NO_2, NO_3) ($ZnAC + NaOH$)
	1, 1250ml, P	W	Ammonia (H_2SO_4)
	1, 125ml P	W	pH
	2, 4L P	W	Gross Alpha/Beta, Sr-90, Pu-235, Pu-238, Co-60, Cs-137 (HNO_3)
B01DZ2	1, 1L, P	W	ICP/AA Metals (HNO_3) Filtered

Field Information** BOL # 2474252282-5 DPC # W192-0-0035-51

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

Overnight Delivery 9213515.0176 Signature Security Service 41

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
WHC		W92-0-0035-48

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Env Eng & Tech	Geoscience	Hydrology

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

Routing EMERY ☒ Contractor ☐ Vendor

Shipped to TMA/NORCAL
2030 Wright Ave
Richmond, CA 94804
Attn: Robert Fox

Off-site Custodian

Full Title

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 79 LBS ~~80 LBS~~	Sample # B01DJ3, B01DJ4, B01F60 Cooler ID SMC-16 Alycooler, groundwater samples packed in wet ice & vermiculite	
1 73 LBS ~~75 LBS~~	Sample # B01DJ0, B01BJ1 Cooler ID #10 Polycooler, groundwater samples packed in wet ice & vermiculite	

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

Necessity for the Off-Site Use of this Property

Sampling Supports RI/FS work in the 300 Area

Bill of Lading 2474252825 ~~2474252814~~

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

RM Clearance for Public Release	RM Survey No.	Date
		12-10-91

Location of Property (Area & Bldg.)	Contact	Phone
300-FF-5	PH Butcher	509 376 5045

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
12/4/91	W802301 PC2CA	

Originated By	Date	Authorized By	Date
PH Butcher		PH Butcher PH Butcher	12/4/91

Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
		[illegible]	12/4/91

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
[illegible]				
Date 12-4-91				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:
White, Green, Yellow, Pink – Property Management Goldenrod – Retain	White – Property Management Yellow – Retain Green – Property Control Custodian (Issuing Office) Pink – Originator

54-3000-479 (09/89)

9213515.0177

Overnight Delivery

Signature Security Service

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
WHC		W92-0-0035-52

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Env. Eng. & Tech.	Geosciences Group	Hydrology

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

Routing Emery ☒ Contractor ☐ Vendor

Shipped to
TMA/NORCAL
2030 Wright Ave
Richmond, CA 94804
Attn: Robert Fox

Off-site Custodian

Full Title

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 65 LBS	Sample #: B01DN8, B01DN9, B01F61 Cooler ID: #64 Polycooler, groundwater samples packed in wet ice & vermiculite	N/A
1 68 LBS	Sample #: B01DL7, B01DL8 Cooler ID: Delta-2 Polycooler, groundwater samples packed in wet ice & vermiculite	N/A

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

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the 300 Area

Bill of Lading # 2474252225

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

RM Clearance for Public Release	RM Survey No.	Date

Location of Property (Area & Bldg.)	Contact	Phone
300-FF-5	P. H. Butcher	509-376-5045

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
12/4/91	W80230/PC2CA	

Originated By	Date	Authorized By	Date
P. H. Butcher	12/4/91	P. H. Butcher	12/4/91

Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
			12/4/91

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
Date 12-4-91				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:
White, Green, Yellow, Pink – Property Management Goldenrod – Retain	White – Property Management Yellow – Retain Green – Property Control Custodian (Issuing Office) Pink – Originator

54-3000-479 (09/89)

Overnight Delivery 9713515.0178

Signature Security Service 4B

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
WHC		W92-0-0035-51

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Env. Eng. & Tech.	Geosciences Group	Hydrology

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

Routing Emery ☒ Contractor ☐ Vendor

Shipped to
TMA/NORCAL
2030 Wright Ave
Richmond, CA 94804
Attn: Robert Fox

Off-site Custodian

Full Title

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 56 LBS	Sample #: B01DY9, B01DZ0 Cooler ID: SMC-34 Polycooler, groundwater samples packed in wet ice & vermiculite	N/A
1 58 LBS	Sample #: B01DZ1, B01DZ2 Cooler ID: Sneezy-1 Polycooler, groundwater samples packed in wet ice & vermiculite	N/A

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

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the 300 Area

Bill of Lading # 247425288-5

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

RM Clearance for Public Release	RM Survey No.	Date

Location of Property (Area & Bldg.)	Contact	Phone
300-FF-5	P. H. Butcher	509-376-5045

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
12/4/91	W80230/PC2CA	

Originated By	Date	Authorized By	Date
P. H. Butcher	12/4/91	P. H. Butcher PHButcher	12/4/91
Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
			12/4/91

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
J Demonet				
Date 12-4-91				

DISTRIBUTION

By Originator	Shipping Operation – Sign all Copies and Forward to:
White, Green, Yellow, Pink – Property Management Goldenrod – Retain	White – Property Management Yellow – Retain Green – Property Control Custodian (Issuing Office) Pink – Originator

54-3000-479 (09/89)

44

FORM OF PAYMENT

CASH ☐ GBL CBL ☐ FCCOD ☐

PPD ☐ COL ☐ OTH ☐ COMAT ☐

Shipper's Account Number: E 850281585

EMERY WORLDWIDE

A CF Company

SERVICES

UNITED STATES / CANADA: Same Day ☐ AM ☐ PM ☐ Second Day ☐ Saturday Delivery ☐

INTERNATIONAL: Express ☐ Preferred ☐ Standard ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

Date: 12/1/92 Origin: PSC Shipment Number: 247425282 5

PULL FOR SHIPT. NO. TAB

From:
WESTINGHOUSE SHIPPING DEPT (509) 376-6665
US DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD
BLDG 1163
2355 STEVENS DRIVE
RICHLAND WA

To:
ROBERT FOX
EPA/NORCAL
2030 WRIGHT AVENUE
RICHMOND CA 94804

Tariff Dest. | Gateway

Check to Shipper $

Hold for Pick Up ☐

Canada ☐

EMERY WORLDWIDE will collect consignee's check made payable only to the shipper for the value of the goods in the amount shown above.

Customer's Reference Numbers: W80230 PC2CA W92-0-0035 48-5299352

Zip: 94804

E Consignee's Account Number

FOR INFORMATION OR RATES CALL 1-800 HI EMERY (1-800-443-6379)

Declared Value $

Description	Pcs.	L	W	H	Total Pieces	Total Weight (In lbs.)
POLYCOOLERS WATER SAMPLES	9	11	11	11	9	575

TODSR ☐ Haz Mat ☐ Edit ☐ A B C D E F G H I J K

1 2 3 4 5 6 7 8 9 0 1 2

SIGNATURE SECURITY SERVICE
OVERNIGHT DELIVERY

Envelope 9X12 ☐ Pack 12X15 ☐

Shipper's Signature: X 12/1/92

International Shipments: Free Domicile ☐ Commodity Code

Third party Account Number mandatory for Third party billing. E Third Party Account Number

Base Charge

International Customs Value | International Insurance

Total Transportation Charges | Other Charges/Advance at Origin ☐ OC/AO- $

247425282 5

1-OAK-A

Terms and Conditions on Back

CONSIGNEE — PACKAGE COPY — 4

FORM NO. 60001-46

97135150179

9713515.0180

APPENDIX A
DATA VALIDATION DOCUMENTATION

Groundwater Volatile Organics Analyses

Thermo Analytical Laboratories

A1 Case Number 12-015
A2 Case Number 12-020
A3 Case Number 12-026
A4 Case Number 12-061
A5 Case Number 01-062
A6 Case Number 01-039

9713515.0181

A1 Case Number 12-015

IT CORP
199806

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ -Indicates that the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value may not accurately the sample quantitation limit.

J -Indicates that the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

R -Indicates that the compound or analyte was analyzed for and due to an identified quality control deficiency the data was unusable.

NJ -Indicates presumptive evidence of a compound at an estimated value.

N -Indicates presumptive evidence of a compound.

9713515.0183

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

9713515.0184

0005
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K14

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	18	
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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	7	J
591-78-6	2-Hexanone	10	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

9713515.0185

0006
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K14

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0186

0007

EPA SAMPLE NO.

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K15

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	BJ
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

9713515.0187

0008
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K15

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0188

0009

EPA SAMPLE NO.

B01DJ3

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K18

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

0010
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K18

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K20

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	B
67-64-1	Acetone	10	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	7	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	3	J
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	10	U
591-78-6	2-Hexanone	10	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

9713515.0191

0012

EPA SAMPLE NO.

B01DL7

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K20

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0192

0013

EPA SAMPLE NO.

B01DN8

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08F

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K21

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

9713515.0193

0014

EPA SAMPLE NO.

B01DN8

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08F

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K21

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DY5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-10E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K23

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	6	B
67-64-1	Acetone	12	
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	9	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	3	J
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	10	U
591-78-6	2-Hexanone	10	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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DY5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-10E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K23

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0196

0017

EPA SAMPLE NO.

B01DY7

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-11E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K24

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	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	10	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	
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	10	U
591-78-6	2-Hexanone	10	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

9713515.0197

0018

EPA SAMPLE NO.

B01DY7

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-11E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K24

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0198

0019

EPA SAMPLE NO.

B01DY9

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-12D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K25

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	10	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	6	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	4	J
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	10	U
591-78-6	2-Hexanone	10	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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DY9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-12D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K25

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DZ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-13D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K26

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	2	BJ
67-64-1	Acetone	10	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	4	J
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	4	J
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	10	U
591-78-6	2-Hexanone	10	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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DZ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-13D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K26

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01F60

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-05A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K19

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	8	B
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

EPA SAMPLE NO.

B01F60

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-05A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K19

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0204

0025

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01F61

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-09A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K22

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	7	B
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01F61

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-09A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K22

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0206

ATTACHMENT 3

Summary of Data Qualifications

9713515.0207

WHC-SD-EN-SPP-002, Rev. 1

DATA QUALIFICATION SUMMARY - FORM B-6

~~SDG~~:	REVIEWER: G. Ooel	DATE: 8/27/92	PAGE ___ OF ___
COMMENTS: All tive fuba properly quantified.			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene chloride	U	All sample except B0ID97	Blank contamination
Acetone	J	All samples	%D >25

ATTACHMENT 4

As Qualified Data Summary

9713515.0209

0005
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K14

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	~~3~~	~~BJ~~ 5U
67-64-1	Acetone	18	J
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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	7	J
591-78-6	2-Hexanone	10	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

EAH 8/31/92

EPA SAMPLE NO.

B01DH7

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K14

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0211

0007
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K15

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	~~2~~	~~BJ~~ 5U
67-64-1	Acetone	10	U J
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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

EAH 8/31/92

9713515.0212

0008
EPA SAMPLE NO.

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K15

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0213

0009
EPA SAMPLE NO.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K18

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	~~4~~	~~BJ~~ 5u
67-64-1	Acetone	10	U J
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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

EAH 8/31/92

9713515.0214

0010
EPA SAMPLE NO.

B01DJ3

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K18

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0215

0011

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K20

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	~~B~~
67-64-1	Acetone	10	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	7	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	3	J
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	10	U
591-78-6	2-Hexanone	10	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

U J

EAH 8/31/9

9713515.0216

0012

EPA SAMPLE NO.

B01DL7

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K20

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9213515.0217

0013

EPA SAMPLE NO.

B01DN8

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08F

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K21

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	~~3~~	~~BJ~~ 5u J
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

EAH 8/31/92

9213515.0218

0014

EPA SAMPLE NO.

B01DN8

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08F

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K21

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0219

0015

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DY5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-10E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K23

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	6	~~B~~ U
67-64-1	Acetone	12	J
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	9	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	3	J
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	10	U
591-78-6	2-Hexanone	10	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

EAH 8/31/9

9713515.0220

0016

EPA SAMPLE NO.

B01DY5

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-10E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K23

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0221

0017

EPA SAMPLE NO.

B01DY7

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-11E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K24

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	10	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	10	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	
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	10	U
591-78-6	2-Hexanone	10	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

EAH 8/31/9

9713515.0222

0018

EPA SAMPLE NO.

B01DY7

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-11E

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K24

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0223

0019

EPA SAMPLE NO.

B01DY9

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-12D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K25

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	4	~~BJ~~ 5u J
67-64-1	Acetone	10	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	6	
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	4	J
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	10	U
591-78-6	2-Hexanone	10	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

ZAH 8/31/92

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DY9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-12D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K25

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

9713515.0225

0021

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DZ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-13D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K26

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	~~2~~	~~BJ~~ 5u
67-64-1	Acetone	10	U J
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	4	J
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	4	J
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	10	U
591-78-6	2-Hexanone	10	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

ZAH 8/31/92

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DZ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-13D

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K26

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01F60

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-05A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K19

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

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

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	8	~~B~~ U
67-64-1	Acetone	10	U J
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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

EAH 8/31/9

EPA SAMPLE NO.

B01F60

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-05A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K19

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/10/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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0025

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01F61

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-09A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K22

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

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

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

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	7	~~B~~
67-64-1	Acetone	10	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	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	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	10	U
591-78-6	2-Hexanone	10	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

JE

EAH 8/31/91

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01F61

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-09A

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 1210K22

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ Date Analyzed: 12/11/91

Column (pack/cap) PACK Dilution Factor: 1.0

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q

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ATTACHMENT 5

Data Review Supporting Documentation

9713515.0232

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: Westinghouse Hanford	REVIEWER: G. Deol	DATE: 8/27/92
LABORATORY: TMA / ARLI	CASE: 12-015	SDG:
SAMPLE/MATRIX: 11 - Water		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?:	Yes	No	N/A
Case Narrative		☑	☐	☐
Data Summary		☑	☐	☐
Chain-of-Custody		☑	☐	☐
QC Summary				
Surrogate report		☑	☐	☐
MS/MSD report		☑	☐	☐
Blank Summary		☑	☐	☐
GC/MS tuning report		☑	☐	☐
Internal standard summary report		☑	☐	☐
Sample Data				
Sample reports		☑	☐	☐
TIC reports for each sample		☑	☐	☐
RIC reports for all samples		☑	☐	☐
Raw and corrected spectra for all detected results	☐	☑	☐	
Raw and corrected library search data for all TIC		☑	☐	☐
Quantitation and calculation data for all TIC		☑	☐	☐
Standard Data				
Initial calibration report		☑	☐	☐
RIC and quantitation reports for initial calibration		☑	☐	☐
Continuing calibration reports		☑	☐	☐
RIC and quantitation reports for cont. calibrations	☐	☑	☐	
Internal standard summary report		☑	☐	☐
Raw QC Data				
Tuning report, spectra and mass lists		☑	☐	☐
Blank analysis reports		☑	☐	☐
TIC reports for all blanks		☑	☐	☐
RIC and quantitation reports for blanks		☑	☐	☐
Raw and corrected spectra for all detected results in blanks		☑	☐	☐
Raw and corrected library search data for all reported TIC		☐	☐	☑

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC	☑	☐	☐
MS/MSD report forms	☑	☐	☐
RIC and quantitation reports for MS/MSD	☑	☐	☐
Additional Data			
Moisture/% solids data sheets	☐	☐	☑
Reduction formulae	☐	☐	☑
Instrument time logs	☐	☐	☑
Chemist notebook pages	☐	☐	☑
Sample preparation sheets	☐	☐	☑

2. HOLDING TIMES (Form B-1)

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? (Yes) No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS (Form B-2)

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a bromofluorobenz. tune report present for each applicable 12-h period? (Yes) No N/A

Do all tunes on all instruments meet the tuning criteria? (Yes) No N/A

Do all tunes on all instruments meet the expanded criteria Yes No (N/A)

Has the laboratory made any calculation or transcription errors? Yes (No) N/A

Have the proper significant figures been reported? (Yes) No N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for nondetects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments? (Yes) No N/A

Are all RSD values ≤30% (2/88 SOW)? (Yes) No N/A

Are all RRF values ≥0.05 (2/88 SOW)? (Yes) No N/A

Are all applicable RSD values ≤20.5% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for nondetects).

3.3 CONTINUING CALIBRATION

Is a continuing calibration report present for all 12-h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for nondetects).

4. BLANKS (Form B-3)

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12-h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results ≤10 times the highest blank concentration for the common laboratory contaminants, as nondetects (U) or at the SQL if the result is <CRQL. Qualify all remaining sample results ≤5 times the blank concentration in similar fashion.

4.2 FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No (N/A)

ACTION: Qualify all detected sample results ≤5 times the amount in any valid field blank as nondetects (U) and note the field blank results in the validation narrative.

5. ACCURACY (Form B-4)

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes (No) N/A

Are any surrogate recoveries < 10%? Yes (No) N/A

Are any method blank surrogate recoveries out of specification? Yes (No) N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for nondetects) for surrogates out of specification but >10%. Qualify all associated positive sample results as estimated (J) an all nondetects results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? (Yes) No N/A

Are MS/MSD recoveries within specification? (Yes) No N/A

Are there any calculation errors? Yes (No) N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is >5 times the spike concentration, no qualification is required, otherwise, qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is the determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the performance audit sample results within the acceptable limits? Yes No (N/A)

ACTION: Note the results of the performance audit sample in the validation narrative.

6. PRECISION (Form B-5)

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? (Yes) No N/A

Are there any calculation errors? Yes (No) N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are >5xCRQL qualify positive results for the specific class of compound (aromatics and nonaromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE (Form B-4)

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes (No) N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes (No) N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for nondetects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION (Form B-6)

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions >10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions present in the reference spectrum present in the sample spectrum?	Yes	No	N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analysis is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as nondetects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as nondetects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY (Form B-7)

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10.0 of the data validation requirements.

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COMMENTS (attach additional sheets as necessary):

See attached pages A1 to B-7.

9713515.0240

HOLDING TIME SUMMARY - FORM B-1

Case # 12-015

~~SDG~~:	REVIEWER: G. Deol	DATE: 8-27-92	PAGE ___ OF ___
COMMENTS:	11 — water MS/MSD analysis on sample # B01DJ0		

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01DK7	CLP-VOA	12/2/91	N/A	12/10/91	N/A	8	None
B01DJ0	" "	"	"	"		8	
B01DJ3	" "	"	"	"		8	
B01F60TB	" "	"	"	"		8	
B01DL7	" "	12/3/91	"	"		7	
B01DN8	" "	"	"	"		7	
B01F61TB	" "	"	"	12/11/91		8	
B01DY5	" "	"	"	12/11/91		8	
B01DY7	" "	"	"	"		8	
B01DY9	" "	"	"	"		8	
B01DZ1	" "	"	"	"		8	

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CALIBRATION DATA SUMMARY - FORM B-2

~~Case~~ # 12-015 ~~SDG~~:	REVIEWER: G. Deol	DATE: 8/27/92	PAGE ___ OF ___
COMMENTS: ~~All~~ ICV ~~& CCV's~~ acceptable. CCV deviation listed.			
CALIB.TYPE: INITIAL CONTINUING		INSTRUMENT: GC/MS ~~58~~ 4500	

CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
12/10/91	Acetone	0.632	-34.2	B01DM7, B01DY5	J
				B01DJ0, B01DJ3	UJ
				B01DL7, B01DN8	
				B01DY7, B01DY9	
				B01DZ1, B01F60	
				B01F61,	

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BLANK AND SAMPLE DATA SUMMARY - FORM B-3

~~SDG~~:	REVIEWER: G. Deol	DATE: 8/27/92	PAGE ___ OF ___

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBL1210A	$MeCl_2$	2	J		ug/L		20	All except B01D47	10 U

9713515.0243

ACCURACY DATA SUMMARY - FORM B-4

Case# 12-015 ~~SDG:~~	REVIEWER: G. Deol	DATE: 8/27/92	PAGE OF
COMMENTS: All surrogate %R within limits.			

SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED

9713515.0244

PRECISION DATA SUMMARY - FORM B-5

~~SDG:~~ Case #	12-015	REVIEWER: C. Dol	DATE: 8/27/92	PAGE ___ OF ___

COMMENTS: All RPD on MS/MSD within specification limits.

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER

9713515.0245

OVERALL ASSESSMENT - FORM B-~~6~~ 7

Case # 12-015

SDG:	REVIEWER: G. Deol	DATE: 8/21/92	PAGE OF

COMMENTS: Overall data quality excellent and all the data quality objectives are satisfied.

Observations:

- The MS/MSD analysis performed on sample # B01DJ0 with acceptable %Rs and RPDs. Spike frequency 9.1 %.
- $MeCl_2$ contamination was reported in blank. The spectra match was marginal. The 10x rule applied to all samples except B01D47 which was reported nondetect for $MeCl_2$.
- During CCV on 12/10/91 the %D for Acetone was > 25%. ~~but it was acceptable per 3/90 SOW guidelines~~ All other compounds during CCV run had %D < 25%
- Data package was well presented.

The results for Acetone will be qualified as follows:

Samples B01D47 + B01D45	'J'	(>MDL)
All other samples	U	(<MDL)

- It seems like sample #s B01FG0 and B01FG1 are field blanks but no clear indication available from COC.

9718515.0247

APPENDIX B
DATA VALIDATION DOCUMENTATION

Groundwater Semivolatile Organics Analyses

Thermo Analytical Laboratories

B1 Case Number 12-015
B2 Case Number 12-020
B3 Case Number 12-026
B4 Case Number 12-061
B5 Case Number 01-062
B6 Case Number 01-039

EACH SUB-APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment is a glossary explaining all data qualifiers used in this data validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports (Form I)

This attachment is a copy of the sample concentration reports as received from the laboratory.

Attachment 3 - Summary of Data Qualifications (Form B-7)

This attachment is a complete summary of all qualifications used in this data validation.

Attachment 4 - As Qualified Data Summary

This attachment is a tabular summary of all data qualified for this validation.

Attachment 5 - Data Review Supporting Documentation

This attachment is a copy of the data validation checklists, data summary forms, telephone contact memoranda and other documents completed for this validation.

9713515.0249

B1 Case Number 12-015

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ -Indicates that the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value may not accurately the sample quantitation limit.

J -Indicates that the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

R -Indicates that the compound or analyte was analyzed for and due to an identified quality control deficiency the data was unusable.

NJ -Indicates presumptive evidence of a compound at an estimated value.

N -Indicates presumptive evidence of a compound.

9713515.0251

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

9713515.0252

0027

EPA SAMPLE NO.

B01DH7

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N05

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N05

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	2	J
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	20	B
218-01-9	Chrysene	10	U
117-84-0	Di-n-octyl Phthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N05

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN CYCLOALKANE	3.20	18	J
2.	UNKNOWN HYDROCARBON	32.86	14	J

9713515.0255

0030

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N06

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N06

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	2	BJ
218-01-9	Chrysene	10	U
117-84-0	Di-n-octyl Phthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N06

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN CYCLOALKANE	3.20	14	J
2.	UNKNOWN HYDROCARBON	40.99	18	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N07

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N07

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	2	BJ
218-01-9	Chrysene	10	U
117-84-0	Di-n-octyl Phthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N07

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	3.22	14	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N08

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N08

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octyl Phthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N08

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN CYCLOALKANE	3.22	14	J

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DN8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N09

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

9713515.0265

0040
EPA SAMPLE NO.

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

B01DN8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N09

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	2	J
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octyl Phthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

(1) - Cannot be separated from Diphenylamine

0041
EPA SAMPLE NO.

B01DN8

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N09

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN CYCLOALKANE	3.22	14	J

9713515.0267

ATTACHMENT 3

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: 12015	REVIEWER: E. Heil	DATE: 8/31/92	PAGE___OF___
COMMENTS: SemiVOA			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All compounds	J	BØ1DH7, BØ1DJ0 & J3	Holding time
bis(2 ethylhexyl) phthalate	u	BØ1DH7, BØ1J0 & BØ1D53	Blank contamination
unknown hydrocarbon	u	All samples	" "
2,4 dinitrophenol	J	↓	%D > 25
TICs	N	↓	

ATTACHMENT 4

As Qualified Data Summary

9213515.0270

0027

EPA SAMPLE NO.

B01DH7

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N05

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

J

EAH 8/31/92

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N05

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
99-09-2	3-Nitroaniline	50	U	J
83-32-9	Acenaphthene	10	U	
51-28-5	2,4-Dinitrophenol	50	U	
100-02-7	4-Nitrophenol	50	U	
132-64-9	Dibenzofuran	10	U	
121-14-2	2,4-Dinitrotoluene	10	U	
606-20-2	2,6-Dinitrotoluene	10	U	
84-66-2	Diethylphthalate	10	U	
7005-72-3	4-Chlorophenyl-phenylether	10	U	
86-73-7	Fluorene	10	U	
100-01-6	4-Nitroaniline	50	U	
534-52-1	4,6-Dinitro-2-methylphenol	50	U	
86-30-6	N-Nitrosodiphenylamine (1)	2	J	
101-55-3	4-Bromophenyl-phenylether	10	U	J
118-74-1	Hexachlorobenzene	10	U	
87-86-5	Pentachlorophenol	50	U	
85-01-8	Phenanthrene	10	U	
120-12-7	Anthracene	10	U	
84-74-2	Di-n-Butylphthalate	10	U	
206-44-0	Fluoranthene	10	U	
129-00-0	Pyrene	10	U	
85-68-7	Butylbenzylphthalate	10	U	
91-94-1	3,3'-Dichlorobenzidine	20	U	
56-55-3	Benzo(a)anthracene	10	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	20	~~B~~	UJ
218-01-9	Chrysene	10	U	J
117-84-0	Di-n-octyl Phthalate	10	U	
205-99-2	Benzo(b)fluoranthene	10	U	
207-08-9	Benzo(k)fluoranthene	10	U	
50-32-8	Benzo(a)pyrene	10	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U	
53-70-3	Dibenz(a,h)Anthracene	10	U	
191-24-2	Benzo(g,h,i)perylene	10	U	

(1) - Cannot be separated from Diphenylamine

BAH 8/31/92

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N05

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	UNKNOWN CYCLOALKANE	3.20	18	J	UN
2.	UNKNOWN HYDROCARBON	32.86	14	J	N

EAH
8/31/92

9713515.0273

0030

EPA SAMPLE NO.

B01DJ0

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N06

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

J

EAH 8/31/92

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N06

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
99-09-2	3-Nitroaniline	50	U	J
83-32-9	Acenaphthene	10	U	
51-28-5	2,4-Dinitrophenol	50	U	
100-02-7	4-Nitrophenol	50	U	
132-64-9	Dibenzofuran	10	U	
121-14-2	2,4-Dinitrotoluene	10	U	
606-20-2	2,6-Dinitrotoluene	10	U	
84-66-2	Diethylphthalate	10	U	
7005-72-3	4-Chlorophenyl-phenylether	10	U	
86-73-7	Fluorene	10	U	
100-01-6	4-Nitroaniline	50	U	
534-52-1	4,6-Dinitro-2-methylphenol	50	U	
86-30-6	N-Nitrosodiphenylamine (1)	10	U	
101-55-3	4-Bromophenyl-phenylether	10	U	
118-74-1	Hexachlorobenzene	10	U	
87-86-5	Pentachlorophenol	50	U	
85-01-8	Phenanthrene	10	U	
120-12-7	Anthracene	10	U	
84-74-2	Di-n-Butylphthalate	10	U	
206-44-0	Fluoranthene	10	U	
129-00-0	Pyrene	10	U	
85-68-7	Butylbenzylphthalate	10	U	
91-94-1	3,3'-Dichlorobenzidine	20	U	
56-55-3	Benzo(a)anthracene	10	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	~~2~~	~~BJ~~	10 (UJ)
218-01-9	Chrysene	10	U	J
117-84-0	Di-n-octyl Phthalate	10	U	
205-99-2	Benzo(b)fluoranthene	10	U	
207-08-9	Benzo(k)fluoranthene	10	U	
50-32-8	Benzo(a)pyrene	10	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U	
53-70-3	Dibenz(a,h)Anthracene	10	U	
191-24-2	Benzo(g,h,i)perylene	10	U	

(1) - Cannot be separated from Diphenylamine

EAH 01/31/92

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DJ0

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N06

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q	
1.	UNKNOWN CYCLOALKANE	3.20	14	J	UN
2.	UNKNOWN HYDROCARBON	40.99	18	J	N

EAH
8/31/92

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N07

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

J

BAH 8/31/92

9713515.0277

0034

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N07

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
99-09-2	3-Nitroaniline	50	U	J
83-32-9	Acenaphthene	10	U	
51-28-5	2,4-Dinitrophenol	50	U	
100-02-7	4-Nitrophenol	50	U	
132-64-9	Dibenzofuran	10	U	
121-14-2	2,4-Dinitrotoluene	10	U	
606-20-2	2,6-Dinitrotoluene	10	U	
84-66-2	Diethylphthalate	10	U	
7005-72-3	4-Chlorophenyl-phenylether	10	U	
86-73-7	Fluorene	10	U	
100-01-6	4-Nitroaniline	50	U	
534-52-1	4,6-Dinitro-2-methylphenol	50	U	
86-30-6	N-Nitrosodiphenylamine (1)	10	U	
101-55-3	4-Bromophenyl-phenylether	10	U	
118-74-1	Hexachlorobenzene	10	U	
87-86-5	Pentachlorophenol	50	U	
85-01-8	Phenanthrene	10	U	
120-12-7	Anthracene	10	U	
84-74-2	Di-n-Butylphthalate	10	U	
206-44-0	Fluoranthene	10	U	
129-00-0	Pyrene	10	U	
85-68-7	Butylbenzylphthalate	10	U	
91-94-1	3,3'-Dichlorobenzidine	20	U	
56-55-3	Benzo(a)anthracene	10	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	~~2~~	BJ	10U
218-01-9	Chrysene	10	U	J
117-84-0	Di-n-octyl Phthalate	10	U	
205-99-2	Benzo(b)fluoranthene	10	U	
207-08-9	Benzo(k)fluoranthene	10	U	
50-32-8	Benzo(a)pyrene	10	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U	
53-70-3	Dibenz(a,h)Anthracene	10	U	
191-24-2	Benzo(g,h,i)perylene	10	U	

(1) - Cannot be separated from Diphenylamine

EAA 8/3/92

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N07

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN HYDROCARBON	3.22	14	J

UN

EAH
8/31/92

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N08

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N08

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
99-09-2	3-Nitroaniline	50	U	
83-32-9	Acenaphthene	10	U	
51-28-5	2,4-Dinitrophenol	50	U	J
100-02-7	4-Nitrophenol	50	U	
132-64-9	Dibenzofuran	10	U	
121-14-2	2,4-Dinitrotoluene	10	U	
606-20-2	2,6-Dinitrotoluene	10	U	
84-66-2	Diethylphthalate	10	U	
7005-72-3	4-Chlorophenyl-phenylether	10	U	
86-73-7	Fluorene	10	U	
100-01-6	4-Nitroaniline	50	U	
534-52-1	4,6-Dinitro-2-methylphenol	50	U	
86-30-6	N-Nitrosodiphenylamine (1)	10	U	
101-55-3	4-Bromophenyl-phenylether	10	U	
118-74-1	Hexachlorobenzene	10	U	
87-86-5	Pentachlorophenol	50	U	
85-01-8	Phenanthrene	10	U	
120-12-7	Anthracene	10	U	
84-74-2	Di-n-Butylphthalate	10	U	
206-44-0	Fluoranthene	10	U	
129-00-0	Pyrene	10	U	
85-68-7	Butylbenzylphthalate	10	U	
91-94-1	3,3'-Dichlorobenzidine	20	U	
56-55-3	Benzo(a)anthracene	10	U	
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U	
218-01-9	Chrysene	10	U	
117-84-0	Di-n-octyl Phthalate	10	U	
205-99-2	Benzo(b)fluoranthene	10	U	
207-08-9	Benzo(k)fluoranthene	10	U	
50-32-8	Benzo(a)pyrene	10	U	
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U	
53-70-3	Dibenz(a,h)Anthracene	10	U	
191-24-2	Benzo(g,h,i)perylene	10	U	

(1) - Cannot be separated from Diphenylamine

EAH 8/3/92

9713515.0281

0038

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

B01DL7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N08

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN CYCLOALKANE	3.22	14	J

UN

EAH
8/31/92

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DN8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N09

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

9713515.0283

0040

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DN8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N09

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	2	J
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-octyl Phthalate	10	U
205-99-2	Benzo(b)fluoranthene	10	U
207-08-9	Benzo(k)fluoranthene	10	U
50-32-8	Benzo(a)pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)perylene	10	U

J

(1) - Cannot be separated from Diphenylamine

8/31/5

9713515.0284

0041
EPA SAMPLE NO.

B01DN8

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 1223N09

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. ____ dec. ____ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/23/91

GPC Cleanup: (Y/N) N pH: ____ Dilution Factor: 1.0

Number TICs found: 1

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN CYCLOALKANE	3.22	14	J

UN

EAH
8/31/92

9713515.0285

ATTACHMENT 5

Data Review Supporting Documentation

SEMI-VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-2

PROJECT: Westinghouse Hanford	REVIEWER: G. Deol	DATE: 8-28-92
LABORATORY: TMA/ARL	CASE: 12-015	SDG:
SAMPLES/MATRIX: 5- water		
Analysis per SOW 3/88		
(See attached pages B-1, B-2, B-3 and B-7)		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓	—	—
Data Summary	✓	—	—
Chain-of-Custody	✓	—	—
QC Summary			
Surrogate report	✓	—	—
MS/MSD report	✓	—	—
Blank summary report	✓	—	—
GC/MS tuning report	✓	—	—
Internal standard summary report	✓	—	—
Sample Data			
Sample reports	✓	—	—
TIC reports for each sample	✓	—	—
RIC reports for all samples	✓	—	—
Raw and corrected spectra for all detected results	✓	—	—
Raw and corrected library search data for all reported TIC	✓	—	—
Quantitation and calculation data for all TIC	✓	—	—
Standards Data			
Initial calibration report	✓	—	—
RIC and quantitation reports for initial calibration	✓	—	—
Continuing calibration reports	✓	—	—
RIC and quantitation reports for cont. calibrations	✓	—	—
Internal standard summary report	✓	—	—
Raw QC Data			
Tuning report, spectra and mass lists	✓	—	—
Blank analysis reports	✓	—	—
TIC reports for all blanks	✓	—	—
RIC and quantitation reports for blanks	✓	—	—
Raw and corrected spectra for all detected results in blanks	✓	—	—
Raw and corrected library search data for all reported TIC	✓	—	—
Quantitation and calculation data for all TIC	✓	—	—
MS/MSD report forms	—	—	✓

Data Package Item	Present?: Yes	No	N/A
RIC and quantitation reports for MS/MSD	—	—	✓
Additional Data			
Moisture/% solids data sheets	—	—	✓
Reduction formulae	—	—	✓
Instrument time logs	—	—	✓
Chemist notebook pages	—	—	✓
Sample preparation sheets	✓	—	—

2. HOLDING TIMES

Were all samples extracted within holding time?	Yes	(No)	N/A
Were all samples analyzed within holding time?	(Yes)	No	N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a DFTPP tune report present for each applicable 12h period?	(Yes)	No	N/A
Do all tunes on all instruments meet the tuning criteria?	(Yes)	No	N/A
Do all tunes on all instruments meet the expanded criteria?	Yes	No	(N/A)
Has the laboratory made any calculation or transciption errors?	Yes	(No)	N/A
Have the proper significant figures been reported?	(Yes)	No	N/A

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects and UJ for nondetects). If all tuning criteria are not met, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments?	(Yes)	No	N/A
Are all RSD values ≤30% (2/88 SOW)?	(Yes)	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	(Yes)	No	N/A
Are all applicable RSD values ≤20.5% (3/90 SOW)?	Yes	No	(N/A)
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	(N/A)

Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to four TCL compounds or surrogates, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all nondetects as unusable (R). Making allowances for up to four TCL compounds or surrogates, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for nondetects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12-h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to four TCL compounds or surrogates, if any RRF value is out of specification qualify all associated detected results as estimated and all nondetects as unusable (R). Making allowances for up to four TCL compounds or surrogates, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for nondetects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every extraction batch?	Yes	No	N/A
Are compounds reported in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results < 10 times the highest blank concentration for the common laboratory contaminants, as nondetects (U) or at the SQL if the result is <CRQL. Qualify all remaining sample results <5 times the blank concentration in similar fashion.

4.2. FIELD BLANKS

Are compounds reported in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results ≤5 times the amount in any valid field blank as nondetects (U) and note the results of the field blanks in the validation narrative.

5. ACCURACY

5.1 SURROGATE RECOVERY/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries < 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated data as estimated (J for detects and UJ for nondetects) if at least two semivolatile surrogates are out of specification. If any surrogate is below 10% recovery qualify associated detected results as estimated (J) and associated nondetect results as unusable (R). If method blank surrogates are out of specification and associated sample surrogates are acceptable no qualification is required, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

See comments.

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is > 5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the results for the performance audit samples within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES See comments

Are all RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are >5xCRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects and UJ for nondetects. If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions > 10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions in the reference spectrum present in the sample spectrum?	Yes	No	N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R).

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standards for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If the quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW?	Yes	No	N/A
Has the laboratory properly identified and coded all TIC?	Yes	No	N/A

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as nondetects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as nondetects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW? Yes No N/A

Were project specific data quality objectives met for this analysis? Yes No N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

See page B-7 for comments

HOLDING TIME SUMMARY - FORM B-1

Case # 12-015

~~SDG:~~	REVIEWER: G. Decl	DATE: 8\28\92	PAGE ___ OF ___

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01DH7	Semivolatile	12\2\91	12\10\91	12\23\91	8	13	J
B01DJ0	"	"	"	"	8	13	↓
B01DJ3	"	"	"	"	8	13	↓
B01DL7	"	12\3\91	"	"	7	13	
B01DN8	"	"	"	"	7	13	

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CALIBRATION DATA SUMMARY - FORM B-2

Cat# 12-015 ~~SDG:~~	REVIEWER: G. Deol	DATE: 8/28/92	PAGE ___ OF ___
COMMENTS: ICV ok.			
CALIB.TYPE: INITIAL CONTINUING		INSTRUMENT:	

CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
12/23/91	2,4-Dinitro phenol	0.183	-34.6	All	None

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BLANK AND SAMPLE DATA SUMMARY - FORM B-3

Case # 12-015 ~~SDG:~~	REVIEWER: G. Deol	DATE: 8/28/92	PAGE ___ OF ___

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
SBLK 1210C	bis(2-Ethylhexyl) Phthalate	310			ug/L		3100	301DH7	20 U
								B01DJ0	10 U
								B01DJ3	10 U
SBLK1210C	(TIC) Unknown Hydrocarbon	14	J	3.20	ug/L	70		All	10 U

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9713515.0297

OVERALL ASSESSMENT - FORM ~~B-6~~ B-7

Case # ~~SDG:~~ 12-015	REVIEWER: G. Deol	DATE: 8/28/92	PAGE ___ OF ___

COMMENTS: Excellent data quality and all data quality objectives were met.

Observations:

The three samples BC1DH7, BC1DJ0 and BC1DJ3 were extracted with 8 days instead of 7 day limit. As all the analytes are reported nondetect and all other QC criteria was acceptable - no serious effect on data quality is assumed. ~~No data flags were deemed necessary~~ qualified result as (J & UJ) EA 8/31/92

No MS/MSD ~~reported~~ performed due to insufficient amount of sample. A separate QC case with lab water MS/MSD (#C1-032) was submitted and results were acceptable.

The % RSD for all analytes during initial calibration were < 30%. During CCV analysis on 12/23/91 only one analyte - 2,4-Dinitrophenol has %D > 25. associated samples were qualified as estimated (UJ) ~~No additional data flags used.~~

One compound from TCL i.e. bis(2-ethylhexyl) Phthalate and one TIC (unknown hydrocarbon) was detected in blanks.

The results for bis(2-ethylhexyl) ~~phta~~ phthalate for samples BC1DH7, BC1DJ0 and BC1DJ3 are qualified as 20U, 10U and 10U respectively. All sample results for TIC - unknown hydrocarbon shall be qualified as non detect '4U'.

9713515.0298

APPENDIX C
DATA VALIDATION DOCUMENTATION

Groundwater Pesticide/PCB Analyses

Thermo Analytical Laboratories

C1 Case Number 12-015
C2 Case Number 12-020
C3 Case Number 12-026
C4 Case Number 12-061
C5 Case Number 01-062
C6 Case Number 01-039

EACH SUB-APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment is a glossary explaining all data qualifiers used in this data validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports (Form I)

This attachment is a copy of the sample concentration reports as received from the laboratory.

Attachment 3 - Summary of Data Qualifications (Form B-7)

This attachment is a complete summary of all qualifications used in this data validation.

Attachment 4 - As Qualified Data Summary

This attachment is a tabular summary of all data qualified for this validation.

Attachment 5 - Data Review Supporting Documentation

This attachment is a copy of the data validation checklists, data summary forms, telephone contact memoranda and other documents completed for this validation.

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C1 Case Number 12-015

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ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ -Indicates that the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value may not accurately the sample quantitation limit.

J -Indicates that the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

R -Indicates that the compound or analyte was analyzed for and due to an identified quality control deficiency the data was unusable.

NJ -Indicates presumptive evidence of a compound at an estimated value.

N -Indicates presumptive evidence of a compound.

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

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

CAS NO.	COMPOUND		Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

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0043

EPA SAMPLE NO.

B01DJ0

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

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0044
EPA SAMPLE NO.

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0306

0045

EPA SAMPLE NO.

B01DL7

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0307

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 0046

B01DN8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0308

0047
EPA SAMPLE NO.

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

B01DY5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-10A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0309

0048

EPA SAMPLE NO.

B01DY7

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-11A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DY9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-12A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0311

0050

EPA SAMPLE NO.

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B01DZ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-13A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

ATTACHMENT 3

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: 12015	REVIEWER: E. Haik	DATE: 8/31/92	PAGE___OF___
COMMENTS: Pest/PCBs			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All compounds	J	B0IDH2, B0IDJ0, TDT3	Extraction holding time

9713515.0314

ATTACHMENT 4

As Qualified Data Summary

9713515.0315

0042

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DH7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-01A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

J

EAH
8/31/92

9713515.0316

0043

EPA SAMPLE NO.

B01DJ0

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-02A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

J

EAH
8/31/92

9713615.0317

0044
EPA SAMPLE NO.

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

B01DJ3

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-03A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

J

EAH
8/31/92

9713515.0318

0045

EPA SAMPLE NO.

B01DL7

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-06A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0319

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 0046

B01DN8

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-08A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0320

0047
EPA SAMPLE NO.

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

B01DY5

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-10A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DY7

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-11A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B01DY9

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-12A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

9713515.0323

0050

EPA SAMPLE NO.

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

B01DZ1

Lab Name: TMA/ARLI Contract: WHC

Lab Code: TMALA Case No.: 12015 SAS No.: NA SDG No.: NA

Matrix: (soil/water) WATER Lab Sample ID: A112015-13A

Sample wt/vol: 1000 (g/mL) ML Lab File ID: _____

Level: (low/med) LOW Date Received: 12/05/91

% Moisture: not dec. __ dec. __ Date Extracted: 12/10/91

Extraction: (SepF/Cont/Sonc) CONT Date Analyzed: 12/21/91

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.050	U
319-85-7	beta-BHC	0.050	U
319-86-8	delta-BHC	0.050	U
58-89-9	gamma-BHC (Lindane)	0.050	U
76-44-8	Heptachlor	0.050	U
309-00-2	Aldrin	0.050	U
1024-57-3	Heptachlor epoxide	0.050	U
959-98-8	Endosulfan I	0.050	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.50	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.50	U
5103-74-2	gamma-Chlordane	0.50	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.50	U
11104-28-2	Aroclor-1221	0.50	U
11141-16-5	Aroclor-1232	0.50	U
53469-21-9	Aroclor-1242	0.50	U
12672-29-6	Aroclor-1248	0.50	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

ATTACHMENT 5

Data Review Supporting Documentation

9713515.0325

9713515.0326

PESTICIDE/PCB DATA VALIDATION CHECKLIST - FORM A-3

PROJECT: Westinghouse Hanford	REVIEWER: G. Deol	DATE: 8/29/92
LABORATORY: TMA/ARLI	CASE: 12-015	SDG: N/A
SAMPLE/MATRIX: a - Water		
Analysis performed per 2/88 - SOW.		
See attached pages B-1, B-2, B-3 + B-7.		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for resubmittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☑	☐	☐
Data Summary	☑	☐	☐
Chain-of-Custody	☑	☐	☐
QC Summary			
Surrogate report	☑	☐	☐
MS/MSD report	☐	☐	☑
Blank Summary	☑	☐	☐
Sample Data			
Sample reports	☑	☐	☐
Chromatograms	☑	☐	☐
GC integration reports	☑	☐	☐
Worksheets	☑	☐	☐
UV traces from GPC	☐	☐	☑
GC/MS confirmation spectra	☐	☐	☑
Standard Data			
Pesticides Evaluation Standards Summary	☑	☐	☐
Pesticides/PCB Standards Summary	☑	☐	☐
Pesticides/PCB identification	☑	☐	☐
Pesticides standard chromatograms	☑	☐	☐
Raw QC Data			
Blank analysis report forms and chromatograms	☑	☐	☐
MS/MSD report forms and chromatograms	☐	☐	☑

Data Package Item	Present?: Yes	No	N/A
Additional Data			
Moisture % solids data sheets	☐	☐	☑
Reduction formulae	☐	☐	☑
Instrument time logs	☑	☐	☐
Chemist notebook pages	☑	☐	☐
Sample preparation sheets	☑	☐	☐

2. HOLDING TIMES (Form B-1)

Were all samples extracted within holding time?	Yes	(No)	N/A
Were all samples analyzed within holding time?	(Yes)	No	N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS (Form B-2)

3.1 INSTRUMENT PERFORMANCE

Are 4-4'- DDT retention times greater than 12 minutes?	(Yes) a.D.	No	(N/A)

ACTION: If DDT retention time is ≤12 minutes and resolution is <25% qualify associated data as unusable (R).

Is resolution between 4-4'- DDT peaks acceptable?	(Yes) a.D.	No	(N/A)

ACTION: If retention between DDT peaks is unacceptable qualify associated data as unusable (R).

Do all pesticide standards elute within the established retention time windows?	(Yes)	No	N/A

ACTION: If the standards do not meet the retention time criteria and peaks are not present near or within the retention time windows no sample qualification is necessary. If peaks are near or within the retention time windows and the standard and matrix spikes do not fall within the expanded retention time windows calculated according to the validation requirements, qualify all associated sample results from the last in-control point as unusable (R).

Are 4-4'- DDT breakdown ≤20%?	(Yes)	No	N/A

ACTION: If the 4-4'- DDT percent breakdown exceeds 20%, qualify all detected results for DDT as estimated (J) and all nondetects as unusable (R) if DDD and DDE are detected. In addition qualify all results for DDD or DDE as presumptive and estimated (NJ).

Are endrin breakdowns ≤20%?	(Yes)	No	N/A

ACTION: If the endrin breakdown exceeds 20%, qualify all detected results for endrin as estimated (J) and all nondetects as unusable (R) if endrin aldehyde or endrin ketone are detected. In addition, qualify all results for endrin ketone as presumptive and estimated (NJ).

Are DBC retention time differences within specifications?	Yes	No	N/A

ACTION: If DBC %D values are outside the limits and the shift is occurring repeatedly in samples and standards, qualify affected sample results as unusable (R).

3.2 INITIAL CALIBRATION (2/88 SOW)

Are RSD values for aldrin, endrin, DDT, and DBC ≤10%?	Yes	No	N/A
Have all standards been analyzed within 72 h of any sample?	Yes	No	N/A
Has a 3-point calibration been conducted for 4-4'- DDT or toxaphene?	Yes	No	N/A
Have all standards been analyzed at the start of each 72 h sequence?	Yes	No	N/A
Have evaluation standards A, B, and C been analyzed within 72 h of any sample?	Yes	No	N/A
Has the confirmation standard mix been analyzed after every five samples?	Yes	No	N/A
Has evaluation standard B been analyzed every 10 samples?	Yes	No	N/A
Are %D values for initial and subsequent standards ≤15% for quantitation standards and ≤20% for confirmation standards?	Yes	No	N/A

ACTION: If the RSD criteria were exceeded or three point calibrations not conducted qualify associated detects as estimated (J). If all standards were not analyzed at the beginning of each 72-h sequence qualify associated data as unusable (R). If the confirmation standards were not analyzed properly qualify associated detects as estimated (J). If the continuing calibration criteria were not met qualify associated quantitation data as estimated (J).

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

Is peak resolution acceptable? Yes No N/A

ACTION: If the resolution criteria are not met, reject positive sample results generated after initial calibration (R).

Are DDT and endrin breakdowns ≤20.0%? Yes No N/A

ACTION: If the breakdown criteria are not met qualify sample results as described in Section 5.3.1 of the data validation requirements.

Are single component target compounds in the PEMs, INDA, INDB and the calibration standards within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the retention time window a review is made of the raw data to determine expanded retention time windows (see Section 5.3.1 of the validation requirements). If all standards and matrix spikes fall within the expanded windows then no qualification of sample results is necessary. If all standards and matrix spikes do not fall within the expanded windows then all affected sample results are qualified as unusable (R).

Are the RPDs acceptable for the PEMs? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are the RSDs for the calibration factors <10.0% (<15% for the BHC series, DDT, endrin, and methoxychlor)? Yes No N/A

ACTION: If the RSD criteria are not met qualify associated positive results as estimated (J).

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Have the analytical sequence requirements been met for the analysis of instrument blanks, PEMs, INDA, INDB mixes? Yes No N/A

ACTION: If the analytical sequence requirements are not followed and any of the resolution or retention time criteria listed below are exceeded, reject associated positive results (R).

Is peak resolution acceptable for PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the resolution criteria are not met reject positive sample results generated after a noncompliant standard analysis (R).

Are single component target compounds in the PEMs, INDA and INDB mixes within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples analyzed after the noncompliant standard within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the expanded windows reject associated positive and nondetect results (R).

Are RPDs between the calculated and true amounts in the PEMs, INDA and INDB mixes ≤25.0%?	Yes	No	N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are DDT and endrin breakdowns in the PEMs ≤20.0% (≤30.0% total combined)?	Yes	No	N/A

ACTION: If the breakdown criteria are not met qualify associated positive sample results in accordance with the criteria specified in Section 5.3.1.

4. BLANKS (Form B-3)

4.1 LABORATORY BLANKS

Has the laboratory analyzed the method blanks at the required frequency?	(Yes)	No	N/A
Has the laboratory analyzed a sulfur clean-up blank if required?	Yes	No	(N/A)
Has the laboratory analyzed instrument blanks at the required frequency?	(Yes)	No	N/A
Are target compounds present in the blanks?	Yes	(No)	N/A

ACTION: Qualify all associated positive results as nondetects (U) that are <5 times the highest concentration in any acceptable blank.

4.2 FIELD BLANKS

Are target compounds present in the field blanks?	Yes	No	(N/A)

ACTION: If target compounds are present in the field blanks qualify all positive sample results <5 times the highest field blank concentrations as nondetects (U) and note the results in the validation narrative.

5. ACCURACY (Form B-4)

5.1 SURROGATE RECOVERY

Are any surrogate recoveries out of specification?	Yes	No	N/A
Do any samples show nondetects for surrogates?	Yes	No	N/A
Are any method blank surrogates out of specification?	Yes	No	N/A

ACTION: Qualify all associated sample results as estimated (J for detects and UJ for nondetects) for surrogates out of specification. If the surrogate was not detected (0% recovery) in the sample qualify associated nondetects as unusable (R). If method blank surrogates are out of specification and sample surrogates are acceptable, no qualification is required however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has the laboratory analyzed a MS/MSD per matrix for the sample group?	Yes	No	N/A	See comment
Are MS/MSD recoveries within specification?	Yes	No	N/A	
Are there any calculation or transcription errors?	Yes	No	N/A	

ACTION: If MS/MSD analyses have not been conducted contact the laboratory for clarification. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is >5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by the low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are performance audit sample results within the acceptance limits?	Yes	No	N/A

ACTION: Note the results of the performance audit samples in the validation narrative.

6. PRECISION (Form B-5)

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

Are the RPD values within specification? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPD values are out of specification and sample results are >5xCRQL qualify positive results as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. COMPOUND IDENTIFICATION AND QUANTITATION (Form B-6)

7.1 COMPOUND IDENTIFICATION

Do positive results meet the retention time window criteria? Yes No N/A

Were positive results analyzed on dissimilar columns? Yes No N/A

If dieldrin and DDE were reported was a 3% OV-1 column used for confirmation (2/88 SOW data only)? Yes No N/A

Do retention times and relative peak height ratios match the expected patterns for multipeak compounds (PCB, toxaphene or chlordane)? Yes No N/A

Has GC/MS confirmation been conducted on sample extract concentrations >10 ppm? Yes No N/A

Note: No sive hits reported.

ACTION: If positive results do not meet the retention time criteria qualify all detected results as nondetects as follows: If the misidentified peak is outside the retention time window and no interferences are noted report the CRQL and if the misidentified peak interferes with a target peak then the report value is qualified as estimated and nondetected (UJ). If positive results were not confirmed on dissimilar columns, reject affected results (R). If a 3% OV-1 was used to confirm dieldrin and DDE, reject the affected data (R). If PCB, chlordane or toxaphene identification is questionable qualify the results as presumptive and estimated (NJ). If GC/MS confirmation was not conducted contact the laboratory for explanation and note in the validation narrative.

7.2 REPORTED RESULTS AND QUANTITATION LIMITS

Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

ACTION: If results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8. OVERALL ASSESSMENT AND SUMMARY (Form B-7)

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

For applicable comments see page B-7.

Case # 12-015

HOLDING TIME SUMMARY - FORM B-1

SDG: W1A	REVIEWER: G. Deol	DATE: 8/29/92	PAGE 1 OF 4
COMMENTS:			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01DH7	Pesticide/ PCB's	12/2/91	12/10/91	12/21/91	8	11	J ~~None~~
B01DJ0	"	"	"	"	8	11	↓
B01DJ3	"	"	"	"	8	11	↓
B01DL7	"	12/3/91	"	"	7	11	None
B01DN8	"	"	"	"	7	11	↓
B01D45	"	"	"	"	7	11	↓
B01D47	"	"	"	"	7	11	↓
B01D49	"	"	"	"	7	11	↓
B01DZ1	"	"	"	"	7	11	↓

9213515.0336

CALIBRATION DATA SUMMARY - FORM B-2

Case # 12-015

~~SDG~~:	REVIEWER: G. Deol	DATE: 8/29/92	PAGE 2 OF 4
COMMENTS: All calibration data acceptable.			
CALIB.TYPE: INITIAL CONTINUING		INSTRUMENT:	

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

9713515.0337

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

Case # 12-015

~~SDG:~~	REVIEWER: G. Deol	DATE: 8/29/92	PAGE 3 OF 4
COMMENTS: No contamination noted in blanks.			

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER

9713515.0338

9713515.0339

OVERALL ASSESSMENT - FORM B-6

Case # 12013 ~~SDG~~:	REVIEWER: G. Beol	DATE: 8/29/92	PAGE 4 OF 4

COMMENTS: Excellent quality data and useable as reported.

Observation

Three samples B01DH7, B01DI0 and B01DI3 were extracted within 8 days instead of CLP limit of 7 days. As the time exceeded only by one day and all analytes are reported 'U' no ~~additional data flags were deemed necessary~~ All sample results were qualified as estimated (J) EAH 9/1/92

No MS/MSD analysis performed with the set due to inadequate sample amount. A separate QC Case # 01-032, with MS/MSD on lab water was submitted with acceptable results.

Some electrical and mechanical failures were cited in case narrative during sequence. From available raw data and QC results, no detrimental effect on data quality is assumed.

9713515.0340

APPENDIX E
DATA VALIDATION DOCUMENTATION

General Chemistry Analyses

Thermo Analytical Laboratories

E1 Case Number 12-015
E2 Case Number 12-020
E3 Case Number 12-026
E4 Case Number 12-061
E5 Case Number 01-062
E6 Case Number 01-039

9715515.0541

E1 Case Number 12-015

IT CORP
199806

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ -Indicates that the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value may not accurately the sample quantitation limit.

J -Indicates that the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

R -Indicates that the compound or analyte was analyzed for and due to an identified quality control deficiency the data was unusable.

NJ -Indicates presumptive evidence of a compound at an estimated value.

N -Indicates presumptive evidence of a compound.

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

9713515.0344

Received: 12/07/91 Results by Sample

SAMPLE ID B01DH7 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 12/02/91 Category WATER

BOD_W <2
mg/L

SAMPLE ID B01DH7 (Dupl) SAMPLE # 01 FRACTIONS: B
Date & Time Collected 12/02/91 Category WATER

BOD_W <2
mg/L

SAMPLE ID B01DJ0 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 12/02/91 Category WATER

BOD_W 2
mg/L

SAMPLE ID B01DJ3 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 12/02/91 Category WATER

BOD_W <2
mg/L

SAMPLE ID B01DL7 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 12/03/91 Category WATER

BOD_W <2
mg/L

SAMPLE ID B01DN8 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 12/03/91 Category WATER

BOD_W <2
mg/L

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc. retains ownership of this report until associated submitted invoice is satisf Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Cl will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the inv amount. The results listed refer only to tested samples and applicable parameters. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc. exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc.
300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3833

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DH7 FRACTION 01B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	5.45	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	4.7	mg/L	0.1
Sulfate	300	30.8	mg/L	0.3

FORM I

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DH7 FRACTION 01C TEST CODE VCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
COD	410.1	<30	mg/L	30
Ammonia	350.3	<0.05	mg/L	0.05

FORM I

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DH7 FRACTION 01D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	8.3	pH	NA
Tot. Dissolved Solids	160.1	255	mg/L	NA
Hardness	130.2	134	mg/L	NA
Alkalinity	310.1	105	mg/L	NA
DO	360.2	41	mg/L	2.0
TSS	160.2	20	mg/L	5

FORM I

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DJ0 FRACTION 02B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	5.66	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	<0.1	mg/L	0.1
Sulfate	300	8.6	mg/L	0.3

FORM I

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ0 FRACTION 02C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
COD	410.1	<30	mg/L	30
Ammonia	350.3	0.07	mg/L	0.05

FORM I

SAMPLE ID B01DJ0 FRACTION 02D TEST CODE WCCLPL NAME Anions and Wet Chemistry
Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	8.4	pH	NA
Tot. Dissolved Solids	160.1	199	mg/L	NA
Hardness	130.2	101	mg/L	NA
Alkalinity	310.1	129	mg/L	NA
DO	360.2	33	mg/L	2.0
TSS	160.2	<5	mg/L	5

FORM I

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ3 FRACTION 03B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
COD	410.1	<30	mg/L	30
Ammonia	350.2	0.14	mg/L	0.05

FORM I

9713515.0352

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ3 FRACTION 03C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	6.14	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	<0.1	mg/L	0.1
Sulfate	300	<0.3	mg/L	0.3

FORM I

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DJ3 FRACTION 03D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	8.5	pH	NA
Tot. Dissolved Solids	160.1	275	mg/L	NA
Hardness	130.2	89	mg/L	NA
Alkalnity	310.1	170	mg/L	NA
DO	360.2	37	mg/L	2.0
TSS	160.2	29	mg/L	5

FORM I

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DL7 FRACTION 06B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.50	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.1	mg/L	0.1
Sulfate	300	31.4	mg/L	0.3

FORM I

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DL7 FRACTION 06C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
COD	410.1	<30	mg/L	30
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DL7 FRACTION 06D TEST CODE VCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.5	pH	NA
Tot. Dissolved Solids	160.1	247	mg/L	NA
Hardness	130.2	128	mg/L	NA
Alkalinity	310.1	103	mg/L	NA
DO	360.2	38	mg/L	2.0
TSS	160.2	9	mg/L	5

FORM I

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DN8 FRACTION 08B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.68	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	13.5	mg/L	0.1
Sulfate	300	48.8	mg/L	0.3

FORM I

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DW8 FRACTION 08C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
COD	410.1	<30	mg/L	30
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DN8 FRACTION 08D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.9	pH	NA
Tot. Dissolved Solids	160.1	392	mg/L	NA
Hardness	130.2	201	mg/L	NA
Alkalinity	310.1	148	mg/L	NA
DO	360.2	41	mg/L	2.0
TSS	16.02	<5	mg/L	5

FORM I

9713515.0360

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY5 FRACTION 10B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.54	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	2.6	mg/L	0.1

FORM I

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY5 FRACTION 10C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY5 FRACTION 10D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.4	pH	NA

FORM I

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DY7 FRACTION 11B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.34	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.0	mg/L	0.1

FORM I

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DY7 FRACTION 11C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

9713515.0365

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY7 FRACTION 11D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.9	pH	NA

FORM I

9713515.0366

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY9 FRACTION 12B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.80	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.3	mg/L	0.1
pH	150.1	8.1	pH	NA

FORM I

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DY9 FRACTION 12C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DZ1 FRACTION 13B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.57	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.3	mg/L	0.1
pH	150.1	8.1	pH	NA

FORM I

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DZ1 FRACTION 13C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350.2	<0.05	mg/L	0.05

FORM I

9713515.0370

ATTACHMENT 3

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: 12-015	REVIEWER: E. Heik	DATE: 9/11/92	PAGE___OF___
COMMENTS: wet chem			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
BOD, pH	J	All samples	Holding time
~~F, NO3, NO2, SO4~~	~~R~~		~~No inst calibration~~
~~COD~~, OD, hardness	R		No titrant standardization
alkalinity	R		↓
~~TSS, TDS~~ *	~~R~~		~~No balance calibration~~
~~pH~~ *	~~R~~		~~No pH meter calibration~~
NH_3-N	J		Holding time, lack of QC such a MS, LCS, blank
		the information that was missing	
		were provided by	the lab

EAH 11/3/92 *

9713515.0372

ATTACHMENT 4

As Qualified Data Summary

9713515.0373

 Skinner&Sherman REPORT Work Order # 91-12-044

Received: 12/07/91 Results by Sample

SAMPLE ID B01DH7 SAMPLE # 01 FRACTIONS: A
Date & Time Collected 12/02/91 Category WATER

BOD_W <2 J
mg/L

SAMPLE ID ~~B01DH7~~ (Dupl) SAMPLE # 01 FRACTIONS: B
Date & Time Collected 12/02/91 Category WATER

BOD_W <2
mg/L

SAMPLE ID B01DJ0 SAMPLE # 02 FRACTIONS: A
Date & Time Collected 12/02/91 Category WATER

BOD_W 2 J
mg/L

SAMPLE ID B01DJ3 SAMPLE # 03 FRACTIONS: A
Date & Time Collected 12/02/91 Category WATER

BOD_W <2 J
mg/L

SAMPLE ID B01DL7 SAMPLE # 04 FRACTIONS: A
Date & Time Collected 12/03/91 Category WATER

BOD_W <2 J
mg/L

SAMPLE ID B01DN8 SAMPLE # 05 FRACTIONS: A
Date & Time Collected 12/03/91 Category WATER

BOD_W <2 J
mg/L

EAH
8/3/92

TMA
Thermo Analytical Inc.

This report is rendered upon all of the following conditions: Skinner & Sherman Laboratories, Inc. retains ownership of this report until associated submitted invoice is satisfi Expert witness services shall be available in conjunction with this report only if prior notification of this potential requirement was made and accepted, before the analysis. Cli will be responsible for Skinner & Sherman costs and consulting fees if our services are required by subpoena or otherwise in legal proceedings. Total liability is limited to the invo amount. The results listed refer only to tested samples and applicable parameters. Product endorsement is neither inferred nor implied. Skinner & Sherman Laboratories, Inc. v exercise due diligence but will not be responsible for lost or destroyed samples or evidence unless client makes appropriate insurance coverage arrangements. Samples are held thirty days following issuance of report. Samples will be stored at client's expense, if authorized in writing.

Skinner & Sherman Laboratories Inc.
300 Second Avenue, P.O. Box 521, Waltham, Massachusetts 02254-0521 (617) 890-7200
1-800-4 LAB TEST FAX (617) 890-3883

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DH7 FRACTION 01B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	5.45	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	4.7	mg/L	0.1
Sulfate	300	30.8	mg/L	0.3

SER 11/4/92

FORM I

EAH 9/1/92

Received: 12/09/91

Results by Sample

SAMPLE ID B01DH7 FRACTION 01C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
COD	410.1	<30	mg/L	30	R EAH 11/3/92
Ammonia	350.3	<0.05	mg/L	0.05	J

EAH
9/1/92

FORM I

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DH7 FRACTION 01D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	8.3	pH	NA
Tot. Dissolved Solids	160.1	255	mg/L	NA
Hardness	130.2	134	mg/L	NA
Alkalinity	310.1	105	mg/L	NA
DO	360.2	41	mg/L	2.0
TSS	160.2	20	mg/L	5

R J

R

EAH 1/13/92

FORM I

EAH 9/1/92

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DJ0 FRACTION 02B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	5.66	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	<0.1	mg/L	0.1
Sulfate	300	8.6	mg/L	0.3

JCR 11/4/92

FORM I

EAH 9/1/92

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ0 FRACTION 02C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
COD	410.1	<30	mg/L	30	R EAH 11/3/92
Ammonia	350.3	0.07	mg/L	0.05	J

FORM I

EAH 9/1/92

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ0 FRACTION 02D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	8.4	pH	NA
Tot. Dissolved Solids	160.1	199	mg/L	NA
Hardness	130.2	101	mg/L	NA
Alkalinity	310.1	129	mg/L	NA
DO	360.2	33	mg/L	2.0
TSS	160.2	<5	mg/L	5

~~R~~ J

R

FORM I

EAH
9/1/92

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ3 FRACTION 03C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	6.14	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	<0.1	mg/L	0.1
Sulfate	300	<0.3	mg/L	0.3

jcr 11/4/92

FORM I

EAH 9/1/92

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ3 FRACTION 03B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
COD	410.1	<30	mg/L	30	~~R~~ EAH 11/3/92
Ammonia	350.2	0.14	mg/L	0.05	J

FORM I

EAH
9/1/92

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DJ3 FRACTION 03D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	8.5	pH	NA
Tot. Dissolved Solids	160.1	275	mg/L	NA
Hardness	130.2	89	mg/L	NA
Alkalnity	310.1	170	mg/L	NA
DO	360.2	37	mg/L	2.0
TSS	160.2	29	mg/L	5

EAH 11/3/92

FORM I

EAH 9/1/92

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DL7 FRACTION 06B TEST CODE VCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.50	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.1	mg/L	0.1
Sulfate	300	31.4	mg/L	0.3

JCR 11/4/92

FORM I

EAH 9/1/92

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DL7 FRACTION 06C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
COD	410.1	<30	mg/L	30	~~R~~ EAH 11/3/92
Ammonia	350.2	<0.05	mg/L	0.05	J

FORM I

EAH
9/1/92

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DL7 FRACTION 06D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.5	pH	NA
Tot. Dissolved Solids	160.1	247	mg/L	NA
Hardness	130.2	128	mg/L	NA
Alkalinity	310.1	103	mg/L	NA
DO	360.2	38	mg/L	2.0
TSS	160.2	9	mg/L	5

R J

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EAH 11/3/92

FORM I

EAH
9/1/92

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DN8 FRACTION 08B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.68	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	13.5	mg/L	0.1
Sulfate	300	48.8	mg/L	0.3

X see 11/4/92

FORM I

EAH 9/1/92

Received: 12/09/91

Results by Sample

SAMPLE ID B01DN8 FRACTION 08C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
COD	410.1	<30	mg/L	30	~~R~~ EAH 11/13/92
Ammonia	350.2	<0.05	mg/L	0.05	J

EAH 9/1/92

FORM I

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DW8 FRACTION 08D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.9	pH	NA
Tot. Dissolved Solids	160.1	392	mg/L	NA
Hardness	130.2	201	mg/L	NA
Alkalinity	310.1	148	mg/L	NA
DO	360.2	41	mg/L	2.0
TSS	16.02	<5	mg/L	5

R J

R

EAH 11/3/92

FORM I

EAH 9/1/92

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DY5 FRACTION 10B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.54	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	2.6	mg/L	0.1

JCR 11/4/92

FORM I

EAH 8/1/92

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY5 FRACTION 10C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
Ammonia	350.2	<0.05	mg/L	0.05	J

FORM I

EAH
9/1/92

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DY5 FRACTION 10D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.4	pH	NA

R J EAH 11/3/92

EAH 9/1/92

FORM I

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY7 FRACTION 11B TEST CODE VCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.34	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.0	mg/L	0.1

JER 11/4/92

FORM I

EAH 7/1/92

TMA Inc. REPORT

Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY7 FRACTION 11C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
Ammonia	350.2	<0.05	mg/L	0.05	J

FORM I

EAH
9/1/92

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY7 FRACTION 11D TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
pH	150.1	7.9	pH	NA

~~R~~ J

~~EAH~~ 11/3/92

EAH 9/1/92

FORM I

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DY9 FRACTION 12B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.80	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.3	mg/L	0.1
pH	150.1	8.1	pH	NA

JKR 11/4/92

FORM I

EAH
9/1/92

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DY9 FRACTION 12C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT	
Ammonia	350.2	<0.05	mg/L	0.05	J

EAH
9/11/92

FORM I

Received: 12/09/91

TMA Inc. REPORT

Results by Sample

Work Order # A1-12-015

SAMPLE ID B01DZ1 FRACTION 13B TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Fluoride	300	9.57	mg/L	0.05
Nitrite	300	<0.05	mg/L	0.05
Nitrate	300	3.3	mg/L	0.1
pH	150.1	8.1	pH	NA

JER 11/4/92

J EAH 11/3/92

FORM I

EAH 9/1/92

TMA Inc. REPORT Work Order # A1-12-015

Received: 12/09/91

Results by Sample

SAMPLE ID B01DZ1 FRACTION 13C TEST CODE WCCLPL NAME Anions and Wet Chemistry

Date & Time Collected not specified Category

ANIONS AND WET CHEMISTRY - LIQUIDS

ANALYSIS	METHOD	RESULT	UNITS	LIMIT
Ammonia	350.2	<0.05	mg/L	0.05

J

EAH
9/1/92

FORM I

9713515.0599

ATTACHMENT 5

Data Review Supporting Documentation

9713515.0400

WHC-SD-EN-SPP-002, Rev. 1

WET CHEMISTRY DATA VALIDATION CHECKLIST - FORM A-7

PROJECT: Westinghouse Hanford	REVIEWER: G. Deol	DATE: 8-29-92
LABORATORY: TMA/ARLI	CASE: 12-015	SDG: N/A
SAMPLE/MATRIX: a - water		
See attached pages B-1, B-2, B-3, B-4, B-5, B-6 and B-7. All results other than 1c - qualified.		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
	G.D.		
Case Narrative	☒	☒	☐
Cover Page	☒	☐	☐
Traffic Reports/Chain-of-Custody	☒	☐	☐
Sample Analysis Data Report Forms	☒	☐	☐
Standards Data	☒	☐	☐
QC Summary			
Blanks Summary Report Forms	☐	☒	☐
Spike Sample Recovery Report Forms	☒	☐	☐
Duplicate Sample Analysis Report Forms	☒	☐	☐
Laboratory Control Sample Report Forms	☐	☒	☐
Raw Data			
Ion Chromatograph Chromatograms	☒	☐	☐
TOC and TOX Instrument Printouts	☐	☐	☒
Laboratory Bench Sheets	☒	☐	☐
Additional Data			
Laboratory Sample Preparation Logs	☐	☐	☒
Instrument Run Logs	☐	☐	☒
Internal Laboratory Chain-of-Custody	☒	☐	☐
Percent Solids Analysis Records	☐	☐	☒
Reduction Formulae	☒	☐	☐
Chemist Notebook Pages	☒	☐	☐

2. HOLDING TIMES (Form B-1)

EAH 8/31/92

Have all samples been analyzed within holding times? (Yes) (No) N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS (Form B-2)

Were all instruments calibrated daily, each set-up time and were the proper number of standards used?	~~Yes~~	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	N/A
Was a balance check conducted prior to the TDS analysis?	Yes	~~No~~	N/A
Was the titrant normality checked?	Yes	No	N/A

For IC only EAH 10/31/92

EAH 11/3/92

Info. not available

ACTION: Qualify all data as unusable (R) if reported from an analysis in which the above criteria were not met.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION (Form B-2)

Have ICV and CCV been analyzed at the appropriate frequency?		Yes	No N/A
Are ICV and CCV percent recoveries within control limits?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

IC only

ACTION: Qualify all affected data in accordance the validation requirements.

5. LABORATORY BLANKS (Form B-3)

for IC only

Are target compounds present in the blanks?	Yes	No	N/A

ACTION: Qualify all associated positive results for any analyte <5 times the amount in any laboratory blank as nondetected (U) and list the affected samples and analytes.

6. FIELD BLANKS (Form B-3)

Are target analytes present in the field blanks?	Yes	No	N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any field blank as nondetected (U).

7. MATRIX SPIKE SAMPLE ANALYSIS (Form B-4)

for IC only

Are spike recoveries within the acceptance limits?	Yes	No	N/A

ACTION: If the sample concentration exceeds the spike concentration by a factor of 4 or more, and spike recoveries are outside the acceptance limits, no qualification is necessary. If spike recovery is outside the control limits and the sample results are >CRQL, qualify the data as estimated (J). If the spike recovery is <30% and the sample results are less than the IDL qualify the data as unusable (R).

8. LABORATORY CONTROL SAMPLE (Form B-4)

Are percent recoveries within the acceptance limits? Yes No (N/A) not availa

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS %R is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

9. PERFORMANCE AUDIT ANALYSIS

Are the performance audit sample results within the acceptance limits? Yes No (N/A)

ACTION: Note the results of the performance audit sample analysis in the data validation narrative.

10. DUPLICATE SAMPLE ANALYSIS (Form B-5)

Are RPD values within the acceptance limits? (Yes) No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the acceptance limits.

11. FIELD DUPLICATE SAMPLES (Form B-5)

Do the RPD values exceed the acceptance limits? Yes No (N/A)

ACTION: Note the results of the field duplicate samples in the validation narrative.

12. FIELD SPLIT SAMPLES (Form B-5)

Do the RPD values exceed the acceptance limits? Yes No (N/A)

ACTION: Note the results of the field split samples in the validation narrative.

13. ANALYTE QUANTITATION AND DETECTION LIMITS (Form B-6)

Have results been reported and calculated correctly?	Yes	No	N/A
Are instrument detection limits below the CRDL?	Yes	No	N/A

ACTION: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

14. OVERALL ASSESSMENT AND SUMMARY (Form B-7)

Has the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

See comments on page B-7.

HOLDING TIME SUMMARY - FORM B-1

Case # 12-015

~~SDG~~:	REVIEWER: G. Deal	DATE: 8/30/92	PAGE OF

COMMENTS:

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01DH7	1, 2, 3, 4	12/2/91	N/A	① 12/13/91	N/A	① ② NH3 ④ ③ 11, 32, 16, 8	J for pH, NH3, BOD
B01DJ0	1, 2, 3, 4	"	"	② - NH3 1/3/92	"	11, 32, 16, 8	"
B01DJ3	1, 2, 3, 4	"	"	③ pH & Alk 12/10/91	"	11, 32, 16, 8	"
B01DL7	1, 2, 3, 4	12/3/91	"	③ TDS & TSS 12/11/91	"	10, 31, 15, 7	"
B01DN8	1, 2, 3, 4	"	"	④ 12/18/91	"	10, 31, 15, 7	"
B01D45	1, 2, 3 (NH3) (pH)	"	"	③ DO 12/12/91	"	10, 31 7	"
B01D47	" " "	"	"	② COD 1/10/92	"	10, 31 7	"
B01D49	" " "	"	"		"	10, 31 7	"
B01DZ1	" " "	"	"		"	10, 31 7	"

for TSS, TDS

① represent F, NO_2^- + NO_3^- only

Analysis request:

① F^-, NO_2^-, NO_3^- + SO_4^{--}

② COD, NH_3

③ pH, TDS, Alkalinity, DO, TSS

④ Hardness

BOD 12/15/91

9213515 0406

CALIBRATION DATA SUMMARY - FORM B-2

~~SDG:~~ Case # 12-015	REVIEWER: G. Deol	DATE: 8/29/92		PAGE ___ OF ___	
COMMENTS:					
CALIB.TYPE:	INITIAL CONTINUING	INSTRUMENT: IC			
CALIB. DATE	~~COMPOUND~~ Analyte	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
~~12/31/91~~	F^-, NO_2^-, NO_3^- + SO_4^{--}		OK		none
10/30/91	All samples were analyzed on 12/31/91 no instrument calibration was provided w sample analysis			All samples	R
	No pH meter calibration			↓	↓
	No analytical balance calibration				
	No titrant standirization for COD, OP, Hardness & Alk				

9713515.0407

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

Case # 12-015

~~SDG:~~	REVIEWER: G. Deol	DATE: 8/29/92	PAGE OF
COMMENTS:	No blanks reported for MRs, Hardness, DO, TDS/TSS. and N-NH3.		

SAMPLE ID	~~COMPOUND~~ Analyte	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
	TDS + TSS	no blanks	and	balance	checks	available		All	~~>MDL J~~ ~~<MDL UJ~~
	No blank for all analyzes except IC								

9713515.0408

ACCURACY DATA SUMMARY - FORM B-4

Case # ~~SDG~~: 12-015	REVIEWER: G. Deal	DATE: 8/29/92	PAGE ___ OF ___	
COMMENTS: matrix spikes not available for all analytes.				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
LCS not available for any ~~analyte~~ analyte.				
MS available for IC analyses only				

9713515.0409

PRECISION DATA SUMMARY - FORM B-5

Case # 12-015 ~~SDG:~~	REVIEWER: G. Deo	DATE: 8/29/92	PAGE ___ OF ___

COMMENTS: RPD on duplicate analysis of all analytes acceptable.

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
~~PAGE~~					

9713515.0410

9713515.0411

CALCULATION SUMMARY - FORM B-6

SDG: 12015	REVIEWER: E. Heik	DATE: 9/1/92	PAGE___OF___
COMMENTS: wet chem			

9713515.0412

APPENDIX D
DATA VALIDATION DOCUMENTATION

Filtered and Unfiltered Metals Analyses

Thermo Analytical Laboratories

D1 Case Number N1-120-34
D2 Case Number N1-120-37
D3 Case Number N1-12-047
D4 Case Number N1-12-114
D5 Case Number N2-01-106
D6 Case Number N2-01-066

EACH SUB-APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment is a glossary explaining all data qualifiers used in this data validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports (Form I)

This attachment is a copy of the sample concentration reports as received from the laboratory.

Attachment 3 - Summary of Data Qualifications (Form B-7)

This attachment is a complete summary of all qualifications used in this data validation.

Attachment 4 - As Qualified Data Summary

This attachment is a tabular summary of all data qualified for this validation.

Attachment 5 - Data Review Supporting Documentation

This attachment is a copy of the data validation checklists, data summary forms, telephone contact memoranda and other documents completed for this validation.

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D1 Case Number N1-120-34

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ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ -Indicates that the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value may not accurately the sample quantitation limit.

J -Indicates that the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

R -Indicates that the compound or analyte was analyzed for and due to an identified quality control deficiency the data was unusable.

NJ -Indicates presumptive evidence of a compound at an estimated value.

N -Indicates presumptive evidence of a compound.

ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DH7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-01S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	324.00			P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	7.50	B	S	F
7440-39-3	Barium	39.40	B		P
7440-41-7	Beryllium	1.40	B		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	40100.00			P
7440-47-3	Chromium	7.50	B		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	490.00			P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	8780.00			P
7439-96-5	Manganese	57.10			P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	5020.00			P
7782-49-2	Selenium	4.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	13400.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	11.30	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DJ0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-02S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	33.40	B		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	43.20	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	19200.00			P
7440-47-3	Chromium	11.20			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	273.00			P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	6810.00			P
7439-96-5	Manganese	105.00			P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	5750.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	26700.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	5.00	U		P
7440-66-6	Zinc	7.00	U		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DJ3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-03S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1570.00			P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	111.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	22400.00			P
7440-47-3	Chromium	65.60			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	2380.00			P
7439-92-1	Lead	3.40			F
7439-95-4	Magnesium	8710.00			P
7439-96-5	Manganese	114.00			P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	27.40	B		P
7440-09-7	Potassium	6170.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	39900.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	5.20	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

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Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DL7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-04S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31.00	U		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	50.60	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	39100.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	83.50	B		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	7330.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	4210.00	B		P
7782-49-2	Selenium	20.00	U	N	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	14500.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	5.30	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DN8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-05S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31.00	U		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	4.40	B	W	F
7440-39-3	Barium	60.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	60400.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	12.00	U		P
7439-92-1	Lead	2.60	B		F
7439-95-4	Magnesium	12300.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	6340.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	23800.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	8.20	B		P
7440-66-6	Zinc	12.50	B		P
	Cyanide	10.00	U		AS

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DY5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-06S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	38.70	B		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	50.60	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	32800.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	70.30	B		P
7439-92-1	Lead	3.10			F
7439-95-4	Magnesium	6410.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	20.00	B		P
7440-09-7	Potassium	3660.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	12300.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	5.90	B		P
7440-66-6	Zinc	18.80	B		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DY7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-07S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	61.20	B		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	39.40	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	39800.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	121.00			P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	7760.00			P
7439-96-5	Manganese	2.70	B		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	4450.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	16600.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	7.10	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0467 WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DY9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-08S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31.00	U		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.20	B	W	F
7440-39-3	Barium	31.90	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	38600.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	12.00	U		P
7439-92-1	Lead	2.10	B		F
7439-95-4	Magnesium	7640.00			P
7439-96-5	Manganese	2.00	U		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	9.00	U		P
7440-09-7	Potassium	4710.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	17000.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	10.60	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DZ1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-09S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	60.00	B		P
7440-36-0	Antimony	47.00	U		P
7440-38-2	Arsenic	2.30	B	W	F
7440-39-3	Barium	39.40	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	3.00	U		P
7440-70-2	Calcium	39100.00			P
7440-47-3	Chromium	28.10			P
7440-48-4	Cobalt	8.00	U		P
7440-50-8	Copper	5.00	U		P
7439-89-6	Iron	208.00			P
7439-92-1	Lead	2.10	B		F
7439-95-4	Magnesium	7850.00			P
7439-96-5	Manganese	5.60	B		P
7439-97-6	Mercury	0.20	U	N	CV
7440-02-0	Nickel	17.00	B		P
7440-09-7	Potassium	4560.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	4.00	U		P
7440-23-5	Sodium	17200.00			P
7440-28-0	Thallium	3.00	U	WN	F
7440-62-2	Vanadium	7.80	B		P
7440-66-6	Zinc	7.00	U		P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0426

1.

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DH8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-01S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	27.40	B		P
7440-36-0	Antimony	15.50	B		P
7440-38-2	Arsenic	6.00	B		F
7440-39-3	Barium	37.10	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	38400.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	23.80	B		P
7439-92-1	Lead	2.80	B		F
7439-95-4	Magnesium	8670.00			P
7439-96-5	Manganese	45.60			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	5050.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	13600.00			P
7440-28-0	Thallium	2.30	B	WN	F
7440-62-2	Vanadium	8.10	B		P
7440-66-6	Zinc	32.40		*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DJ1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DHS

Matrix (soil/water): WATER Lab Sample ID: 12046-02S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	30.60	B		P
7440-36-0	Antimony	14.00	U		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	42.50	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	19000.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	211.00			P
7439-92-1	Lead	5.20			F
7439-95-4	Magnesium	6720.00			P
7439-96-5	Manganese	97.40			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	5620.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	26300.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	2.00	U		P
7440-66-6	Zinc	5.70	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DJ4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-03S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	51.20	B		P
7440-36-0	Antimony	26.90	B		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	99.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	21900.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	284.00			P
7439-92-1	Lead	2.50	B		F
7439-95-4	Magnesium	8580.00			P
7439-96-5	Manganese	86.70			P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	6620.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	40800.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	2.00	U		P
7440-66-6	Zinc	7.80	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DL8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-045

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	19.40	B		P
7440-36-0	Antimony	14.00	U		P
7440-38-2	Arsenic	2.00	B	W	F
7440-39-3	Barium	50.70	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	39600.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	110.00			P
7439-92-1	Lead	5.80			F
7439-95-4	Magnesium	7450.00			P
7439-96-5	Manganese	1.60	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	4160.00	B		P
7782-49-2	Selenium	4.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	14700.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	3.80	B		P
7440-66-6	Zinc	13.10	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DN9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-05S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	38.80	B		P
7440-36-0	Antimony	25.60	B		P
7440-38-2	Arsenic	4.10	B	W	F
7440-39-3	Barium	55.70	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	60800.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	47.00	B		P
7439-92-1	Lead	4.90			F
7439-95-4	Magnesium	12400.00			P
7439-96-5	Manganese	1.20	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	6570.00			P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	24200.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	6.90	B		P
7440-66-6	Zinc	8.40	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DY6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-06S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	69.10	B		P
7440-36-0	Antimony	14.00	U		P
7440-38-2	Arsenic	2.00	U	W	F
7440-39-3	Barium	50.40	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.50	B		P
7440-70-2	Calcium	34200.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	94.10	B		P
7439-92-1	Lead	1.00	U		F
7439-95-4	Magnesium	6730.00			P
7439-96-5	Manganese	1.90	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	3800.00	B		P
7782-49-2	Selenium	20.00	U	MN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	12400.00			P
7440-28-0	Thallium	10.00	U	WN	F
7440-62-2	Vanadium	3.10	B		P
7440-66-6	Zinc	14.10	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0432 1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DY8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-07S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29.50	B		P
7440-36-0	Antimony	16.80	B		P
7440-38-2	Arsenic	2.00	U		F
7440-39-3	Barium	39.00	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	40600.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	4.20	B		P
7439-89-6	Iron	27.60	B		P
7439-92-1	Lead	1.20	B	W	F
7439-95-4	Magnesium	7870.00			P
7439-96-5	Manganese	2.50	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	4310.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	16800.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	5.00	B		P
7440-66-6	Zinc	6.80	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01D20

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-08S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	29.50	B		P
7440-36-0	Antimony	14.00	U		P
7440-38-2	Arsenic	3.90	B	W	F
7440-39-3	Barium	35.40	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	40300.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	18.80	B		P
7439-92-1	Lead	1.90	B		F
7439-95-4	Magnesium	8000.00			P
7439-96-5	Manganese	1.00	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	4780.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	17600.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	8.50	B		P
7440-66-6	Zinc	7.30	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DZ2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-09S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	31.90	B		P
7440-36-0	Antimony	14.80	B		P
7440-38-2	Arsenic	2.40	B	W	F
7440-39-3	Barium	34.80	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	1.00	U		P
7440-70-2	Calcium	40600.00			P
7440-47-3	Chromium	2.00	U		P
7440-48-4	Cobalt	2.00	U		P
7440-50-8	Copper	2.00	U		P
7439-89-6	Iron	30.60	B		P
7439-92-1	Lead	1.00	U		F
7439-95-4	Magnesium	8110.00			P
7439-96-5	Manganese	1.00	B		P
7439-97-6	Mercury	0.20	U		CV
7440-02-0	Nickel	5.00	U		P
7440-09-7	Potassium	4720.00	B		P
7782-49-2	Selenium	20.00	U	WN	F
7440-22-4	Silver	5.00	U		P
7440-23-5	Sodium	17600.00			P
7440-28-0	Thallium	2.00	U	WN	F
7440-62-2	Vanadium	7.30	B		P
7440-66-6	Zinc	7.80	B	*	P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

ATTACHMENT 3

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: N12034	REVIEWER: E. Haik	DATE: 9/1/92	PAGE___OF___
COMMENTS: Metals			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Se	R	All samples	% MS < 30
Tl	J	↓	% MS < 75 + Anal. spike < 85
As	J	All except B01DH7	% Anal. spike < 85

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: N112034	REVIEWER: Entrik	DATE: 9/1/92	PAGE___OF___
COMMENTS: Metals Filtered			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
AL	u	All samples	Blank contamination
Sb	u	BØ1DH8, BØ1DJ4, BØ1DN9, BØ1DY8, BØDZ2	
Fe	u	All samples except BØ1DJ1 & BØ1DJ4	
pb		All samples except BØ1DY6, BØ1DY8, 1DZ0, Z2	
V		All samples except BØ1DJ1, J4,	
Zn		All samples	
Mn		BØ1DL8, BØ1DN9, BØ1DY6, BØ1DY8	BØDZ0 BØ1DZ2
~~pb~~ Zn	J	All samples	RPD > 20
Se	J		%MS < 75 & r < 0.995
Tl	J		% MS & Analytical spikes
Se	J	All samples except BØ1DY6	% Analytical spike < 85
As	J	All samples except BØ1DH8, BØ1DJ1 & BØ1DX8	
pb	J	BØ1DX8	

EAH 9/1/92

9713515.0458

ATTACHMENT 4

As Qualified Data Summary

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DH7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-01S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	324.00			P	
7440-36-0	Antimony	47.00	U		P	
7440-38-2	Arsenic	7.50	B	S	F	
7440-39-3	Barium	39.40	B		P	
7440-41-7	Beryllium	1.40	B		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	40100.00			P	
7440-47-3	Chromium	7.50	B		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	5.00	U		P	
7439-89-6	Iron	490.00			P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	8780.00			P	
7439-96-5	Manganese	57.10			P	
7439-97-6	Mercury	0.20	U	N	CV	
7440-02-0	Nickel	9.00	U		P	
7440-09-7	Potassium	5020.00			P	
7782-49-2	Selenium	4.00	U	WN	F	R
7440-22-4	Silver	4.00	U		P	
7440-23-5	Sodium	13400.00			P	
7440-28-0	Thallium	3.00	U	WN	F	J
7440-62-2	Vanadium	11.30	B		P	
7440-66-6	Zinc	7.00	U		P	
	Cyanide	10.00	U		AS	

EAH 9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0790

WESTINGHOUSE/HANFORD

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INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DJ0

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-02S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	33.40	B		P	
7440-36-0	Antimony	47.00	U		P	
7440-38-2	Arsenic	2.00	U	W	F	J
7440-39-3	Barium	43.20	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	19200.00			P	
7440-47-3	Chromium	11.20			P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	5.00	U		P	
7439-89-6	Iron	273.00			P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	6810.00			P	
7439-96-5	Manganese	105.00			P	
7439-97-6	Mercury	0.20	U	N	CV	
7440-02-0	Nickel	9.00	U		P	
7440-09-7	Potassium	5750.00			P	
7782-49-2	Selenium	20.00	U	WN	F	R
7440-22-4	Silver	4.00	U		P	
7440-23-5	Sodium	26700.00			P	
7440-28-0	Thallium	3.00	U	WN	F	J
7440-62-2	Vanadium	5.00	U		P	
7440-66-6	Zinc	7.00	U		P	
	Cyanide	10.00	U		AS	

EAH 9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9713515.0441

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DJ3

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-03S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	1570.00			P	
7440-36-0	Antimony	47.00	U		P	
7440-38-2	Arsenic	2.00	U	W	F	J
7440-39-3	Barium	111.00	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	22400.00			P	
7440-47-3	Chromium	65.60			P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	5.00	U		P	
7439-89-6	Iron	2380.00			P	
7439-92-1	Lead	3.40			F	
7439-95-4	Magnesium	8710.00			P	
7439-96-5	Manganese	114.00			P	
7439-97-6	Mercury	0.20	U	N	CV	
7440-02-0	Nickel	27.40	B		P	
7440-09-7	Potassium	6170.00			P	
7782-49-2	Selenium	20.00	U	WN	F	R
7440-22-4	Silver	4.00	U		P	
7440-23-5	Sodium	39900.00			P	
7440-28-0	Thallium	3.00	U	WN	F	J
7440-62-2	Vanadium	5.20	B		P	
7440-66-6	Zinc	7.00	U		P	
	Cyanide	10.00	U		AS	

EAH 9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0942

WESTINGHOUSE/HANFORD

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DL7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-04S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	31.00	U		P	
7440-36-0	Antimony	47.00	U		P	
7440-38-2	Arsenic	2.00	U	W	F	J
7440-39-3	Barium	50.60	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	39100.00			P	
7440-47-3	Chromium	6.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	5.00	U		P	
7439-89-6	Iron	83.50	B		P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	7330.00			P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	0.20	U	N	CV	
7440-02-0	Nickel	9.00	U		P	
7440-09-7	Potassium	4210.00	B		P	
7782-49-2	Selenium	20.00	U	N	F	R
7440-22-4	Silver	4.00	U		P	
7440-23-5	Sodium	14500.00			P	
7440-28-0	Thallium	3.00	U	WN	F	J
7440-62-2	Vanadium	5.30	B		P	
7440-66-6	Zinc	7.00	U		P	
	Cyanide	10.00	U		AS	

EAH
9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9713515.0993

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER:

B01DN8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-05S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	31.00	U		P	
7440-36-0	Antimony	47.00	U		P	
7440-38-2	Arsenic	4.40	B	W	F	J
7440-39-3	Barium	60.00	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	60400.00			P	
7440-47-3	Chromium	6.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	5.00	U		P	
7439-89-6	Iron	12.00	U		P	
7439-92-1	Lead	2.60	B		F	
7439-95-4	Magnesium	12300.00			P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	0.20	U	N	CV	
7440-02-0	Nickel	9.00	U		P	
7440-09-7	Potassium	6340.00			P	
7782-49-2	Selenium	20.00	U	WN	F	R
7440-22-4	Silver	4.00	U		P	
7440-23-5	Sodium	23800.00			P	
7440-28-0	Thallium	3.00	U	WN	F	J
7440-62-2	Vanadium	8.20	B		P	
7440-66-6	Zinc	12.50	B		P	
	Cyanide	10.00	U		AS	

EAH
9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

006

FORM I - IN Rev.6/89

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DY5

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-06S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	38.70	B		P	
7440-36-0	Antimony	47.00	U		P	
7440-38-2	Arsenic	2.00	U	W	F	J
7440-39-3	Barium	50.60	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	32800.00			P	
7440-47-3	Chromium	6.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	5.00	U		P	
7439-89-6	Iron	70.30	B		P	
7439-92-1	Lead	3.10			F	
7439-95-4	Magnesium	6410.00			P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	0.20	U	N	CV	
7440-02-0	Nickel	20.00	B		P	
7440-09-7	Potassium	3660.00	B		P	
7782-49-2	Selenium	20.00	U	WN	F	R
7440-22-4	Silver	4.00	U		P	
7440-23-5	Sodium	12300.00			P	
7440-28-0	Thallium	3.00	U	WN	F	J
7440-62-2	Vanadium	5.90	B		P	
7440-66-6	Zinc	18.80	B		P	
	Cyanide				NR	

EAH
9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DY7

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-07S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	61.20	B		P	
7440-36-0	Antimony	47.00	U		P	
7440-38-2	Arsenic	2.00	U	W	F	J
7440-39-3	Barium	39.40	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	39800.00			P	
7440-47-3	Chromium	6.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	5.00	U		P	
7439-89-6	Iron	121.00			P	
7439-92-1	Lead	2.00	U		F	
7439-95-4	Magnesium	7760.00			P	
7439-96-5	Manganese	2.70	B		P	
7439-97-6	Mercury	0.20	U	N	CV	
7440-02-0	Nickel	9.00	U		P	
7440-09-7	Potassium	4450.00	B		P	
7782-49-2	Selenium	20.00	U	WN	F	R
7440-22-4	Silver	4.00	U		P	
7440-23-5	Sodium	16600.00			P	
7440-28-0	Thallium	3.00	U	WN	F	J
7440-62-2	Vanadium	7.10	B		P	
7440-66-6	Zinc	7.00	U		P	
	Cyanide				NR	

EAH
9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

WESTINGHOUSE/HANFORD

9713515.0946

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DY9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-08S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	31.00	U		P	
7440-36-0	Antimony	47.00	U		P	
7440-38-2	Arsenic	2.20	B	W	F	J
7440-39-3	Barium	31.90	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	38600.00			P	
7440-47-3	Chromium	6.00	U		P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	5.00	U		P	
7439-89-6	Iron	12.00	U		P	
7439-92-1	Lead	2.10	B		F	
7439-95-4	Magnesium	7640.00			P	
7439-96-5	Manganese	2.00	U		P	
7439-97-6	Mercury	0.20	U	N	CV	
7440-02-0	Nickel	9.00	U		P	
7440-09-7	Potassium	4710.00	B		P	
7782-49-2	Selenium	20.00	U	WN	F	R
7440-22-4	Silver	4.00	U		P	
7440-23-5	Sodium	17000.00			P	J
7440-28-0	Thallium	3.00	U	WN	F	
7440-62-2	Vanadium	10.60	B		P	
7440-66-6	Zinc	7.00	U		P	
	Cyanide				NR	

EAH 9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DZ1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH7

Matrix (soil/water): WATER Lab Sample ID: 12045-09S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	60.00	B		P	
7440-36-0	Antimony	47.00	U		P	
7440-38-2	Arsenic	2.30	B	W	F	J
7440-39-3	Barium	39.40	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	3.00	U		P	
7440-70-2	Calcium	39100.00			P	
7440-47-3	Chromium	28.10			P	
7440-48-4	Cobalt	8.00	U		P	
7440-50-8	Copper	5.00	U		P	
7439-89-6	Iron	208.00			P	
7439-92-1	Lead	2.10	B		F	
7439-95-4	Magnesium	7850.00			P	
7439-96-5	Manganese	5.60	B		P	
7439-97-6	Mercury	0.20	U	N	CV	
7440-02-0	Nickel	17.00	B		P	
7440-09-7	Potassium	4560.00	B		P	
7782-49-2	Selenium	20.00	U	WN	F	R
7440-22-4	Silver	4.00	U		P	
7440-23-5	Sodium	17200.00			P	
7440-28-0	Thallium	3.00	U	WN	F	J
7440-62-2	Vanadium	7.80	B		P	
7440-66-6	Zinc	7.00	U		P	
	Cyanide				NR	

EAH 9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9715515.0448 1.

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DH8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-013

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	27.40	~~B~~		P	U
7440-36-0	Antimony	15.50	~~B~~		P	U
7440-38-2	Arsenic	6.00	B		F	
7440-39-3	Barium	37.10	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	1.00	U		P	
7440-70-2	Calcium	38400.00			P	
7440-47-3	Chromium	2.00	U		P	
7440-48-4	Cobalt	2.00	U		P	
7440-50-8	Copper	2.00	U		P	
7439-89-6	Iron	23.80	~~B~~		P	U
7439-92-1	Lead	2.80	~~B~~		F	U
7439-95-4	Magnesium	8670.00			P	
7439-96-5	Manganese	45.60			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.00	U		P	
7440-09-7	Potassium	5050.00			P	
7782-49-2	Selenium	20.00	U	WN	F	J
7440-22-4	Silver	5.00	U		P	
7440-23-5	Sodium	13600.00			P	
7440-28-0	Thallium	2.30	B	WN	F	J
7440-62-2	Vanadium	8.10	~~B~~		P	U
7440-66-6	Zinc	32.40		*	P	U J
	Cyanide				NR	

EAH 9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0449

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DJ1

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-02S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	30.60	~~B~~		P	u
7440-36-0	Antimony	14.00	U		P	
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	42.50	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	1.00	U		P	
7440-70-2	Calcium	19000.00			P	
7440-47-3	Chromium	2.00	U		P	
7440-48-4	Cobalt	2.00	U		P	
7440-50-8	Copper	2.00	U		P	
7439-89-6	Iron	211.00			P	
7439-92-1	Lead	5.20			F	u
7439-95-4	Magnesium	6720.00			P	
7439-96-5	Manganese	97.40			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.00	U		P	
7440-09-7	Potassium	5620.00			P	
7782-49-2	Selenium	20.00	U	WN	F	J
7440-22-4	Silver	5.00	U		P	
7440-23-5	Sodium	26300.00			P	
7440-28-0	Thallium	2.00	U	WN	F	J
7440-62-2	Vanadium	2.00	U		P	
7440-66-6	Zinc	5.70	~~B~~	*	P	u J
	Cyanide				NR	

EAH 9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0450

1

INORGANIC ANALYSIS DATA SHEET

SAMPLE NUMBER: B01DJ4

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: - SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-03S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	51.20	~~B~~		P	u
7440-36-0	Antimony	26.90	~~B~~		P	u
7440-38-2	Arsenic	2.00	U	W	F	J
7440-39-3	Barium	99.00	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	1.00	U		P	
7440-70-2	Calcium	21900.00			P	
7440-47-3	Chromium	2.00	U		P	
7440-48-4	Cobalt	2.00	U		P	
7440-50-8	Copper	2.00	U		P	
7439-89-6	Iron	284.00			P	
7439-92-1	Lead	2.50	~~B~~		F	u
7439-95-4	Magnesium	8580.00			P	
7439-96-5	Manganese	86.70			P	
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.00	U		P	
7440-09-7	Potassium	6620.00			P	
7782-49-2	Selenium	20.00	U	WN	F	J
7440-22-4	Silver	5.00	U		P	
7440-23-5	Sodium	40800.00			P	
7440-28-0	Thallium	2.00	U	WN	F	J
7440-62-2	Vanadium	2.00	U		P	
7440-66-6	Zinc	7.80	~~B~~	*	P	uJ
	Cyanide				NR	

EAH 9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN

Rev. 6/89

9713515.0451

1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DL8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKTNER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-043

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	19.40	~~B~~		P	U
7440-36-0	Antimony	14.00	U		P	
7440-38-2	Arsenic	2.00	B	W	F	J
7440-39-3	Barium	50.70	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	1.00	U		P	
7440-70-2	Calcium	39600.00			P	
7440-47-3	Chromium	2.00	U		P	
7440-48-4	Cobalt	2.00	U		P	
7440-50-8	Copper	2.00	U		P	
7439-89-6	Iron	110.00			P	U
7439-92-1	Lead	5.80			F	U
7439-95-4	Magnesium	7450.00			P	
7439-96-5	Manganese	1.60	~~B~~		P	U
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.00	U		P	
7440-09-7	Potassium	4160.00	B		P	
7782-49-2	Selenium	4.00	U	WN	F	J
7440-22-4	Silver	5.00	U		P	
7440-23-5	Sodium	14700.00			P	
7440-28-0	Thallium	2.00	U	WN	F	J
7440-62-2	Vanadium	3.80	~~B~~		P	U ~~J~~
7440-66-6	Zinc	13.10	~~B~~	*	P	U J
	Cyanide				NR	

~~EAH~~ 9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0452 1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DN9

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-05S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	38.80	~~B~~		P	u
7440-36-0	Antimony	25.60	~~B~~		P	u
7440-38-2	Arsenic	4.10	B	W	F	J
7440-39-3	Barium	55.70	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	1.00	U		P	
7440-70-2	Calcium	60800.00			P	
7440-47-3	Chromium	2.00	U		P	
7440-48-4	Cobalt	2.00	U		P	
7440-50-8	Copper	2.00	U		P	
7439-89-6	Iron	47.00	~~B~~		P	u
7439-92-1	Lead	4.90			F	u
7439-95-4	Magnesium	12400.00			P	
7439-96-5	Manganese	1.20	~~B~~		P	u
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.00	U		P	
7440-09-7	Potassium	6570.00			P	
7782-49-2	Selenium	20.00	U	WN	F	J
7440-22-4	Silver	5.00	U		P	
7440-23-5	Sodium	24200.00			P	
7440-28-0	Thallium	2.00	U	WN	F	J
7440-62-2	Vanadium	6.90	~~B~~		P	u
7440-66-6	Zinc	8.40	~~B~~	*	P	uJ
	Cyanide				NR	

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Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9713515.0453 1

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DY6

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-06S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	69.10	B		P	u
7440-36-0	Antimony	14.00	U		P	
7440-38-2	Arsenic	2.00	U	W	F	J
7440-39-3	Barium	50.40	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	1.50	B		P	u
7440-70-2	Calcium	34200.00			P	
7440-47-3	Chromium	2.00	U		P	
7440-48-4	Cobalt	2.00	U		P	
7440-50-8	Copper	2.00	U		P	
7439-89-6	Iron	94.10	B		P	u
7439-92-1	Lead	1.00	U		F	
7439-95-4	Magnesium	6730.00			P	
7439-96-5	Manganese	1.90	B		P	u
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.00	U		P	
7440-09-7	Potassium	3800.00	B		P	
7782-49-2	Selenium	20.00	U	MN	F	J
7440-22-4	Silver	5.00	U		P	
7440-23-5	Sodium	12400.00			P	
7440-28-0	Thallium	10.00	U	WN	F	J
7440-62-2	Vanadium	3.10	B		P	u
7440-66-6	Zinc	14.10	B	*	P	uJ
--	Cyanide				NR	

EAH 9/1/92

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DY8

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12045-078

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	29.50	~~B~~		P	u
7440-36-0	Antimony	16.80	~~B~~		P	u
7440-38-2	Arsenic	2.00	U		F	
7440-39-3	Barium	39.00	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	1.00	U		P	
7440-70-2	Calcium	40600.00			P	
7440-47-3	Chromium	2.00	U		P	
7440-48-4	Cobalt	2.00	U		P	
7440-50-8	Copper	4.20	B		P	
7439-89-6	Iron	27.60	~~B~~		P	u
7439-92-1	Lead	1.20	B	W	F	J
7439-95-4	Magnesium	7870.00			P	
7439-96-5	Manganese	2.50	~~B~~		P	u
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.00	U		P	
7440-09-7	Potassium	4310.00	B		P	
7782-49-2	Selenium	20.00	U	WN	F	J
7440-22-4	Silver	5.00	U		P	
7440-23-5	Sodium	16800.00			P	
7440-28-0	Thallium	2.00	U	WN	F	J
7440-62-2	Vanadium	5.00	~~B~~		P	u
7440-66-6	Zinc	6.80	~~B~~	*	P	u, J
	Cyanide				NR	

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Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01D20

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-08S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	29.50	~~B~~		P	u
7440-36-0	Antimony	14.00	U		P	
7440-38-2	Arsenic	3.90	B	W	F	J
7440-39-3	Barium	35.40	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	1.00	U		P	
7440-70-2	Calcium	40300.00			P	
7440-47-3	Chromium	2.00	U		P	
7440-48-4	Cobalt	2.00	U		P	
7440-50-8	Copper	2.00	U		P	
7439-89-6	Iron	18.80	~~B~~		P	u
7439-92-1	Lead	1.90	B		F	
7439-95-4	Magnesium	8000.00			P	
7439-96-5	Manganese	1.00	~~B~~		P	u
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.00	U		P	
7440-09-7	Potassium	4780.00	B		P	
7782-49-2	Selenium	20.00	U	WN	F	J
7440-22-4	Silver	5.00	U		P	
7440-23-5	Sodium	17600.00			P	
7440-28-0	Thallium	2.00	U	WN	F	J
7440-62-2	Vanadium	8.50	~~B~~		P	u
7440-66-6	Zinc	7.30	~~B~~	*	P	uJ
	Cyanide				NR	

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Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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SAMPLE NUMBER:

INORGANIC ANALYSIS DATA SHEET

B01DZ2

Lab Name: SKINNER & SHERMAN LABS. Contract: 68-D0-0108

Lab Code: SKINER Case No.: N112034 SAS No.: SDG No.: B01DH8

Matrix (soil/water): WATER Lab Sample ID: 12046-09S

Level (low/med): LOW Date Received: 12/07/91

% Solids: 0.0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	31.90	B		P	U
7440-36-0	Antimony	14.80	B		P	U
7440-38-2	Arsenic	2.40	B	W	F	J
7440-39-3	Barium	34.80	B		P	
7440-41-7	Beryllium	1.00	U		P	
7440-43-9	Cadmium	1.00	U		P	
7440-70-2	Calcium	40600.00			P	
7440-47-3	Chromium	2.00	U		P	
7440-48-4	Cobalt	2.00	U		P	
7440-50-8	Copper	2.00	U		P	
7439-89-6	Iron	30.60	B		P	U
7439-92-1	Lead	1.00	U		F	
7439-95-4	Magnesium	8110.00			P	
7439-96-5	Manganese	1.00	B		P	U
7439-97-6	Mercury	0.20	U		CV	
7440-02-0	Nickel	5.00	U		P	
7440-09-7	Potassium	4720.00	B		P	
7782-49-2	Selenium	20.00	U	WN	F	J
7440-22-4	Silver	5.00	U		P	
7440-23-5	Sodium	17600.00			P	
7440-28-0	Thallium	2.00	U	WN	F	J
7440-62-2	Vanadium	7.30	B		P	U
7440-66-6	Zinc	7.80	B	*	P	UJ
	Cyanide				NR	

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Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

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ATTACHMENT 5

Data Review Supporting Documentation

9713515.0458

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: Westinghouse Hanford	REVIEWER: G. Deol	DATE: 8/25/92
LABORATORY: SKINER	CASE: N1-12-034	SDG: B010M7
SAMPLE/MATRIX: a - water		
See attached pages B-1 to B-7 for		
comments and data qualifications		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☑	☐	☐
Cover Page	☑	☐	☐
Traffic Reports	☑	☐	☐
Sample Data			
Inorganic Analysis Data Sheets	☑	☐	☐
Standards Data			
Initial and Continuing Calibration Verification	☑	☐	☐
CRDL Standard for AA and ICP	☑	☐	☐
QC Summary			
Blanks	☑	☐	☐
ICP Interference Check Summary	☑	☐	☐
Spike Sample Recovery	☑	☐	☐
Post-Digestion Spike Sample Recovery	☑	☐	☐
Duplicate	☑	☐	☐
Laboratory Control Sample	☑	☐	☐
Standard Addition Results	☑	☐	☐
ICP Serial Dilutions	☑	☐	☐
Instrument Detection Limits	☑	☐	☐
ICP Interelement Correction Factors	☑	☐	☐
ICP Linear Ranges	☑	☐	☐
Preparation Log	☑	☐	☐
Analysis Run Log	☑	☐	☐
Raw Data			
ICP Raw Data	☑	☐	☐
Furnace AA Raw Data	☑	☐	☐
Mercury Raw Data	☑	☐	☐
Cyanide Raw Data	☑	☐	☐
Additional Data			
Internal laboratory chain-of-custody	☑	☐	☐
Laboratory Sample Preparation Records	☑	☐	☐

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	☐	☐	☑
Reduction Formulae	☑	☐	☐
Instrument Run Logs	☑	☐	☐
Chemist notebook pages	☑	☐	☐

2. HOLDING TIMES (Form B-1)

Have all samples been analyzed within holding times? (Yes) No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS (Form B-2)

Were all instruments calibrated daily, each set-up time and was the proper number of standards used? (Yes) No N/A

Are the correlation coefficients ≥0.995? See remarks (Yes) No N/A

Was a midrange cyanide standard distilled? (Yes) No N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.0995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION (Form B-2)

Are ICV and CCV percent recoveries within control limits? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE (Form B-2)

Has an ICS sample been analyzed at the proper frequency? (Yes) No N/A

Are the AB solution %R values within control? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS (Form B-3)

Are target compounds present in the blanks? (Yes) No N/A

ACTION: Qualify all associated positive results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS (Form B-3)

Are target analytes present in the field blanks? Yes No (N/A)

ACTION: Qualify all sample results for any analyte <5 times the amount in any field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS (Form B-4)

Are spike recoveries within the control limits? Yes (No) N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE (Form B-4)

Are percent recoveries within the acceptance limits? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSIS

Are the performance audit sample results within the acceptance limits? Yes No (N/A)

ACTION: Note the results of the performance audit sample analysis in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS (Form B-5)

Are RPD values acceptable? (Yes) No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION (Form B-6)

Are the serial dilution results acceptable? (Yes) No N/A

Is there evidence of negative interference? Yes (No) N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgement to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No (N/A)

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No (N/A)

ACTION: Note the results of the field split samples in the validation narrative.

15/16. FURNACE ATOMIC ABSORPTION QUALITY CONTROL (Form B-6)

Do all applicable analyses have duplicate injections? (Yes) No N/A

Are applicable duplicate injection ~~RSD~~ CV % values within control limits? (Yes) No N/A

If no, were samples rerun once as required? (Yes) No N/A

Does the ~~RSD~~ CV % for the rerun fall within the control limits? (Yes) No N/A

Were analytical spike recoveries within the control limits? Yes (No) N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients ≥0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is ≥10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correlation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS (Form B-6)

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibration range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

ACTION: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY (Form B-7)

Have the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary): See page B-7

HOLDING TIME SUMMARY - FORM B-1

SDG: B01DH7	REVIEWER: G. Deol	DATE: 8/25/92	PAGE 1 OF 7
COMMENTS: Dup analysis on B01DH7 and spike analysis on B01DJ0			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01DH7	① AS	12/2/91	① ~~12/12/91~~ 12/12/91	① 12/13/91	① ② ③ ④ 10, 9, 32, 10	① ② ③ ④ 11, 9, 36/52, 33	None
B01DJ0	② CN	"	② 12/11/91	② 12/11/91	10, 9, 32, 32	11, 9, " "	
B01DJ3	③ F	"	③ 1/3/92	③ PB+TI 1/7/92	10, 9, " "	11, 9, " "	
~~B01DJ3~~	④ P			③ AS+SE 1/23/92			
B01DL7		12/3/91	④ 1/3/92		④, 8, 31, 31	10, 8, 35/51, 34	
B01DN8		"		④ 1/6/92	④, 8, ", "	10, 8, " "	
B01DY5		"			-, 8, " "	- 8, " "	
B01DY7		"			-, 8, " "	- 8, " "	
B01DY9		"			-, 8, " "	- 8, " "	
B01DZ1		"			-, 8, " "	- 8, " "	

Note: Cyanide analysis required only on first five samples.

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CALIBRATION DATA SUMMARY - FORM B-2

SDG: 301047	REVIEWER: G. Deol	DATE: 8/25/92	PAGE 2 OF 7
COMMENTS: All ICVs & CCVs within specification limits.			
CALIB.TYPE: INITIAL CONTINUING		INSTRUMENT:	

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

9713515.0465

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B01DH7	REVIEWER: G. Deol	DATE: 8-25-92	PAGE 3 OF 7

COMMENTS: only highest contaminant conc. listed which was used for data qualification.

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
Prep Blank	Ba	-3.8	B		ug/L		38	B01DY9 See attachment	required redigestion
	Fe	-26.4	B		"		264	B01DY7, B01DY5 ~~B01DY2, B01DE4~~	required redigestion
ICB	Be	-1.4	B		"		14	B01DH7	" "
	Fe	-26.8	B		"		268		
CCB higest cont.	Ca	34.0	B		"	170		None	
	Cr	-6.2	B		"		62	B01DH7 B01DJ0 B01DZ1	

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ACCURACY DATA SUMMARY - FORM B-4

SDG: B01DK7	REVIEWER: G. Deol	DATE: 8/25/92	PAGE 4 OF 7	
COMMENTS:				
SAMPLE ID	~~COMPOUND~~ ELEMENT	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B01DJ0S	Hg	213.0	All	~~UJ~~ None
"	Se	0.0	"	R
"	Tl	72.8	"	UJ
BØ1DH2	Tl	71.3		J, UJ
BØ1DJ0	Tl, As	72.3, 41.5		
BØ1DJ3	Tl, As	71.3, 46.1		
BØ1DL7	Tl, As	74.3, 52.7		
BØ1DN8	Tl & As	66.4, 51.8		
BØ1DY5	Tl & As	64.5, 52.0		
BØ1DY7	Tl & As	67.4, 61.9		
BØ1DY9	Tl & As	68.4, 61.5		
BØ1DZ1	Tl & As	73.3, 52.9		

9713515.0467

PRECISION DATA SUMMARY - FORM B-5

SDG: B01DH7	REVIEWER: G. Dal	DATE: 8/25/92	PAGE 5 OF 7
COMMENTS: Duplicate precision ok on all applicable analytes.			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER

9713515.0468

OVERALL ASSESSMENT - FORM B-~~6~~ 7

SDG: B01DH7	REVIEWER: G. Deol	DATE: 8/25/92	PAGE ___ OF ___

COMMENTS: Overall data quality is good and data is useable as reported along with qualifications.

Observation:

Duplicate and spike analysis performed at a frequency of 11.1 %.

No co-efficients of linear regression reported for F-analysis. The co-efficients were calculated from available raw data and reported. All co-efficients were > 0.995.

Matrix effects were noted for Se & Tl. The Se matrix effects were severe and MDL was raised to 20 ug/L for all samples except B01DH7. All Se results are qualified as unuseable 'R' and Tl results as 'UJ'.

The post digest spike % Rs were also < 85% for all ~~samples~~ samples for Se & Tl.

~~The post digest % R for Hg~~

No additional flags required.

As all Hg results were reported ND - no qualifications need for matrix spike recovery which was > 125 %.

LCS results for Hg & CN not reported on form 7.

9713515.0470

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: Westinghouse Hanford Co	REVIEWER: G. Deol	DATE:
LABORATORY: S+S Labs	CASE: N11 2034	SDG: B01D H8
SAMPLE/MATRIX: a - water		
Duplicate + spike frequency: 11.1 %		

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal of the omitted data.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	☑	☐	☐
Cover Page	☑	☐	☐
Traffic Reports	☑	☐	☐
Sample Data			
Inorganic Analysis Data Sheets	☑	☐	☐
Standards Data			
Initial and Continuing Calibration Verification	☑	☐	☐
CRDL Standard for AA and ICP	☑	☐	☐
QC Summary			
Blanks	☑	☐	☐
ICP Interference Check Summary	☑	☐	☐
Spike Sample Recovery	☑	☐	☐
Post-Digestion Spike Sample Recovery	☑	☐	☐
Duplicate	☑	☐	☐
Laboratory Control Sample	☑	☐	☐
Standard Addition Results	a.a. ☑	☐	☑
ICP Serial Dilutions	☑	☐	☐
Instrument Detection Limits	☑	☐	☐
ICP Interelement Correction Factors	☑	☐	☐
ICP Linear Ranges	☑	☐	☐
Preparation Log	☑	☐	☐
Analysis Run Log	☑	☐	☐
Raw Data			
ICP Raw Data	☑	☐	☐
Furnace AA Raw Data	☑	☐	☐
Mercury Raw Data	☑	☐	☐
Cyanide Raw Data	☐	☐	☑
Additional Data			
Internal laboratory chain-of-custody	☑	☐	☐
Laboratory Sample Preparation Records	☑	☐	☐

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	☐	☐	☑
Reduction Formulae	☑	☐	☐
Instrument Run Logs	☑	☐	☐
Chemist notebook pages	☑	☐	☐

2. HOLDING TIMES (Form B-1)

Have all samples been analyzed within holding times? (Yes) No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for\ detects and UJ for nondetects).

3. INITIAL CALIBRATIONS (Form B-2)

Were all instruments calibrated daily, each set-up time and was the proper number of standards used? (Yes) No N/A

Are the correlation coefficients ≥0.995? (Yes) (No) 4.D 8/24 N/A

Was a midrange cyanide standard distilled? Yes No (N/A)

SR (1\23\92) = 0.988, 0.993

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.0995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION (Form B-2)

Are ICV and CCV percent recoveries within control limits? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE (Form B-2)

Has an ICS sample been analyzed at the proper frequency? (Yes) No N/A

Are the AB solution %R values within control? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS (Form B-3)

Are target compounds present in the blanks? (Yes) No N/A

ACTION: Qualify all associated positive results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS (Form B-3)

Are target analytes present in the field blanks? Yes No (N/A)

ACTION: Qualify all sample results for any analyte <5 times the amount in any field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS (Form B-4)

Are spike recoveries within the control limits? Yes (No) N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE (Form B-4)

Are percent recoveries within the acceptance limits? (Yes) No N/A

Are there calculation errors? Yes (No) N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSIS

Are the performance audit sample results within the acceptance limits? Yes No (N/A)

ACTION: Note the results of the performance audit sample analysis in the data validation narrative.

11. DUPLICATE SAMPLE ANALYSIS (Form B-5)

Are RPD values acceptable? Yes (No) N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION (Form B-6)

Are the serial dilution results acceptable? (Yes) No N/A

Is there evidence of negative interference? Yes (No) N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgement to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No (N/A)

ACTION: Note the results of the field duplicate samples in the validation narrative.

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No (N/A)

ACTION: Note the results of the field split samples in the validation narrative.

15/16. FURNACE ATOMIC ABSORPTION QUALITY CONTROL (Form B-6)

Do all applicable analyses have duplicate injections? (Yes) No N/A

Are applicable duplicate injection ~~RSD~~ CV% values within control limits? (Yes) (No) N/A

If no, were samples rerun once as required? (Yes) No N/A

Does the ~~RSD~~ CV% for the rerun fall within the control limits? (Yes) No N/A

Were analytical spike recoveries within the control limits? Yes (No) N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients ≥0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is ≥10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correlation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS (Form B-6)

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibration range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

ACTION: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY (Form B-7)

Have the laboratory conducted the analysis in accordance with the analytical SOW?	Yes	No	N/A
Were project specific data quality objectives met for this analysis?	Yes	No	N/A

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

Excellent data quality and data useable with qualifications.

For applicable comments see pages B-1 to B-7.

B01DH8

HOLDING TIME SUMMARY - FORM B-1

SDG:	REVIEWER: G. DEOL	DATE: 8/24/92	PAGE 7 OF
COMMENTS: All samples analyzed within holding times.			

FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B01DH8	1 CV	12/2/91	1 12/11/91	1 12/11/91	1 9	1 9	None
B01DJ1	2 P	"	2 1/3/92	2 1/6/92	2 32	2 35	
B01DJ4	3 F	"	3 1/3/92	3 1/23/92	3 32	3 52	
B01DL8		12/3/91			1 8	8	
B01DN9		"			2 31	34	
B01DY86		"			3 31	51	
B01DY8		"					
B01DZ0		"					
B01DZ2		"					

9713515.0426

CALIBRATION DATA SUMMARY - FORM B-2

SDG: B0104 8	REVIEWER: G. Deol	DATE: 8/24/92	PAGE 2 OF ___
COMMENTS: All ICVs / CCVs are well within limits.			(Hg 80 - 120 % ; All other metals 90 - 110 %)
CALIB.TYPE: INITIAL CONTINUING		INSTRUMENT:	

CALIB. DATE	COMPOUND	~~RF~~ r	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
	Se	<0.995		All samples	J

9713515.0477

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: B010H8	REVIEWER: G. Deol	DATE: 8-24-92	PAGE ___ OF ___
COMMENTS:	Only highest concentration listed		

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS ug/L	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
Prep Blanks	Al	32.7 B	B			163.5		All samples	u
	Sb	17.5	B			87.5		B0 1DH8, B0 1DN9, B0 1DJ4, B0 1DZ2, B0 1DY8	u
	Ca	27.5	B			137.5		None	
	Cr	-2.6	B				26	None	
	Fe	26.8	B			134.0		All samples except B0 1DJ4, DT1	u
	Mn	1.0	B			5.0		B0 1DL8, B0 1DN9, B0 1DZ0, B0 1DY6, B0 1DY8, B0 1DZ2	u
	Zn	9.9	B			49.5		All samples	u
CCB 1,2,3 highest contaminant	Ba	1.5	B			7.5		None	
	Cd	1.1	B			5.5		B0 1Dy6	u
	Co	3.4	B			17.0		None	
	Cu	-5.4	B				54	None	
	Pb	2.5	B			12.5		B0 1DH8, B0 1DJ1, B0 1DJ4, B0 1DL8, B0 1DN9	(u)
	Mn	1.9	B			9.5		See above	
	V	2.3	B			11.5		All samples except B0 1DJ1, J4	u
ICB	Mg	-24.6	B				246	None	
	Se	4.2	B			13.2		None	
	Na	-68.5	B				685	None	
CCB	Pb	-1.3	B				-10.3	B0 1DY8, B0 1DZ0, ~~B0 1DZ2~~ } required redigestion	

97135150.0478

ACCURACY DATA SUMMARY - FORM B-4

SDG: B010H8	REVIEWER: G Deol	DATE: 8/24/92	PAGE OF	
COMMENTS: LCS %Rs acceptable for all metals.				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
BØ1DH8s	Se	48.2	All sample	J, UJ
↓	Tl	42.8	↓	↓
BØ1DH8	Tl, Se (Analytical spike)	78.4, 81.6		J, UJ
BØ1DJ1	Tl, Se	47.4, 45.2		
BØ1DJ4	Tl, Se, As	44.9, 45.2, 74.7		
BØ1DL0	Tl, Se, As	44.0, 44.7, 44.9		
BØ1DN9	Tl, Se, As	41.5, 55.0, 52.9		
BØ1DX6	Tl, Se, As	39.0, 52.0		
BØ1DX8	Tl, Se, pb	42.9, 76.6, 80.5		
BØ1DZ0	Tl, Se, As	44.8, 48.4, 70.5		
BØ1DZ2	Tl, Se, As	44.8, 73.2 66.0		

9713515.0479

PRECISION DATA SUMMARY - FORM B-5

SDG: B010H8	REVIEWER: G. Dool	DATE: 8/24/92	PAGE ___ OF ___		
COMMENTS: Duplicate analysis on sample # B010H8					
~~COMPOUND~~ Element	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Zn	B010H8	B010H8D	200	~~none~~ All sample	UJ.
Note: The original results on sample # B010H8 (32.4 ug/L) are qualified as 'J' due to blank contamination and all other Zn results are qualified as 'UJ' at CRDL due to blank contamination. ~~No further qualifications needed.~~					
	qualified sample results as estimated (J) due to high RPD				
	EAH 9/11/92				

9713515.0480

DATA QUALIFICATION SUMMARY - FORM B-6

SDG: B01DH8	REVIEWER: G. Deol	DATE: 8-24-92	PAGE OF
COMMENTS: Matrix spike run on sample # B01DH8			
~~COMPOUND~~ Element	QUALIFIER	SAMPLES AFFECTED	REASON
Se	UJ	All	Matrix Spike %R = 46.2
Tl	UJ	All except B01DH8	Matrix Spike %R = 42.8
Tl	J	B01DH8	" "
Furnace AA QC			
Tl	J	B01DH8	%R < 85
	UJ	All Except B01DH8	" "
As	UJ	B01DJ4, B01DJ6	" "
As	J	B01DL8, B01DN9 B01DZ0, B01DZ2	" "
Se → All samples already qualified as UJ. the %R < 85 on all samples except B01DJ6.			

9713515.0482

OVERALL ASSESSMENT - FORM B-~~8~~ 7

SDG: B01DH8	REVIEWER: G. Deol	DATE:	PAGE ___ OF ___

COMMENTS: Good quality data and useable with listed data qualifications.

Observations:

No co-efficients of linear regression reported for furnance analysis. The r for Se < 0.995. The r co-efficients were calculated from raw data & recorded on applicable raw data pages. The r values for Se analyses were <0.995

Matrix effects noted for Se + Tl as indicated by low post digest spike %Rs and matrix spike recovery. The MDL for Se was raised to 20 ug/l for all samples except B01DL8. Data flagged per DV guidelines.

Minor blank contamination and -ive values noted for various blanks. All contamination < CRDL. The 5x and 10x rule applied on basis of highest concentration.

Zinc duplicate precision exceeded control limits. ~~No Data qualified~~. The results for sample B01DH8 qualified as 'J' due to blank contamination. All other samples are qualified as 'U' at CRDL due to blank contamination. ~~No additional qualifications required.~~ Results have been qualified as estimated (J)

EAH 9/1/92

9713515.0483

Data Package Completeness Checklists

TMA/Norcal NI-12-028-9573

B01DH7
B01DJ0
B01DJ3
B01DL7
B01DN8
B01DY5
B01DY7
B01DY9
B01DZ1

Gross α/β

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- NA Weights of Carriers Added, If Applicable
- NA Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- NA Results of Statistical Test Used to Evaluate Instrument Background
- NA Control Limits for Check Source and Background Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

_____ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
_____ Weights of Precipitates or Solids Counted
_____ Calculated Recoveries

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Aliquots of Samples
✓ Weights of Solids Counted
✓ Count Durations
✓ Sample Identifications
✓ Calculated Precision

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

SR-90

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

missing:
B01DH7 (not logged in according to log-in verif.)
OK analysis was cancelled JTK

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- ✓ Weights of Carriers Added, If Applicable
- ✓ Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- ✓ Results of Statistical Test Used to Evaluate Instrument Background
- NA Control Limits for Check Source and Background Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- NO MDA of Method will calculate
- ✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Aliquots of Samples
- ✓ Weights of Solids Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

TC-99

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

missing: B0ID H7

B0ID H7 HAD 99TC LATER CANCELLED DATA ok

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Prepared or Counted
✓ Weights of Solids Counted

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
✓ Amount of (Check) Standard Used
✓ Raw Data including Counts and Count Duration for Standards
✓ Weights of Preparations
✓ Efficiencies
NA Weights of Carriers Added, If Applicable
NA Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
✓ Raw Data of Background Counts and Count Duration
NA Results of Statistical Test Used to Evaluate Instrument Background
NA Control Limits for Check Source and Background Counts

Blanks

✓ Detector Identification
✓ Date of Analysis
NO MDA of Method will calculate
✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Aliquots of Samples
- ✓ Weights of Solids Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

9713515.0490

Supplemental Requirements for the Analysis of
Tritium Using Liquid Scintillation Counting

F.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration) no notebook page
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Instrument Identification
- ✓ Analysis Date and Analyst Initials
- ✓ Sample Weight

Initial and Continuing Instrument Calibration

- ✓ Instrument Identification
- ✓ Identification of Calibration Standards including Radionuclides, Certification, Issue or Expiration Date and Activity
- NA Amount of Standard Used for Calibration
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
- ✓ Counting Efficiency Determination Method and Results
- ✓ Quench Correction Method

Blanks

- ✓ Instrument Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used
- NA Lot Numbers of Reagents Used
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, Background Count Duration)
- ✓ Tritium Levels in Background Water

Duplicates

- ✓ Instrument Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- NA Amount of Spike for Spiked Duplicates

✓ Raw Data (Gross Counts, Count Duration, Background Counts, and Background Count Duration)

Radiometric Yields

✓ Amount of Tritium Standard Used for Radiometric Yield Determination

✓ Radiometric Yield Calculations and Results

Laboratory Control Samples

✓ Sample Identification

✓ Instrument Identification

✓ Date of Analysis

✓ Calculated Recoveries

✓ Results of Analyses

F.1 General

Scope

This Appendix provides supplemental information used for validating analytical data from the determination of tritium in water using liquid scintillation counting.

Applicability

The validation criteria in this appendix are intended to be applied in addition to those found in the body of the procedure. In cases where discrepancies exist between the requirements of the procedure and the appendix, the criteria in the appendix shall apply.

F.2 Calibration

Liquid scintillation counting systems are calibrated using NIST traceable external or internal standards. The chemical and physical matrix of the standards should resemble the samples as closely as possible in order to match light emission (scintillation) and quenching properties.

- If the matrix of the standard is not representative of that for the samples, qualify all associated results as estimated, (J).

9713515.0492

Supplemental Requirements for the Analysis of
Pu-241 Using Liquid Scintillation Counting

F.0 Completeness Checklist

Analysis Results

missing:
B01DH7
B01DY5
B01DY7
B01DY8
B01DZ1

these were mis-marked. they should have been ~~DA~~ analysis. PATAOK

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
✓ Calculation Sheets
✓ Sample Identifications
Instrument Identification
✓ Analysis Date and Analyst Initials
✓ Sample Weight

Initial and Continuing Instrument Calibration

✓ Instrument Identification
✓ Identification of Calibration Standards including Radionuclides, Certification, Issue or Expiration Date and Activity
NA Amount of Standard Used for Calibration
✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
✓ Counting Efficiency Determination Method and Results
NA Quench Correction Method

Blanks

✓ Instrument Identification
✓ Date of Analysis
NO MDA of Method will calculate
✓ Amounts of Reagents Used
NA Lot Numbers of Reagents Used
✓ Raw Data (Gross Counts, Count Duration, Background Count, Background Count Duration)
✓ ~~Tritium Levels~~ in Background Water
Pu-241

Duplicates

✓ Instrument Identification
✓ Date of Analysis
✓ Amounts of Samples
NA Amount of Spike for Spiked Duplicates

✓ Raw Data (Gross Counts, Count Duration, Background Counts, and Background Count Duration)

Radiometric Yields

✓ Amount of ~~Tritium~~ Tracer/Carrier Standard Used for Radiometric Yield Determination

✓ Radiometric Yield Calculations and Results

Laboratory Control Samples

✓ Sample Identification

✓ Instrument Identification

✓ Date of Analysis

✓ Calculated Recoveries

✓ Results of Analyses

F.1 General

Scope

This Appendix provides supplemental information used for validating analytical data from the determination of tritium in water using liquid scintillation counting.

Applicability

The validation criteria in this appendix are intended to be applied in addition to those found in the body of the procedure. In cases where discrepancies exist between the requirements of the procedure and the appendix, the criteria in the appendix shall apply.

F.2 Calibration

Liquid scintillation counting systems are calibrated using NIST traceable external or internal standards. The chemical and physical matrix of the standards should resemble the samples as closely as possible in order to match light emission (scintillation) and quenching properties.

- If the matrix of the standard is not representative of that for the samples, qualify all associated results as estimated, (J).

Iso-U

Supplemental Requirements for Analyses Using Alpha Spectroscopy

B.0 Completeness Checklist

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted (Precipitated or Deposited)

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Spectra or Counts per Channel
NA Kev/channel
NA Count Duration for Standards
✓ Efficiencies
NA Raw Data of Background Counts, Dates Counted, and Duration of Counts

Blanks

✓ Detector Identification
✓ Date of Analysis
✓ MDA of Method
✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Alpha Spectroscopy (Cont.)

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

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Iso-Pu

Supplemental Requirements for Analyses Using Alpha Spectroscopy

B.0 Completeness Checklist

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted (Precipitated or Deposited)

missing:
B01DH7
B01DY5
B01DY7
B01DY9
B01DZ1

Should be U (Iso) Analysis Data OK N

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Spectra or Counts per Channel
NA Kev/channel
NA Count Duration for Standards
✓ Efficiencies
NA Raw Data of Background Counts, Dates Counted, and Duration of Counts

Blanks

✓ Detector Identification
✓ Date of Analysis
✓ MDA of Method
✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using
Alpha Spectroscopy (Cont.)

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples Counted
✓ Count Durations
✓ Sample Identifications
✓ Calculated Precision

Radiometric and Gravimetric Yields

✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
✓ Weights of Precipitates or Solids Counted
✓ Calculated Recoveries

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

Supplemental Requirements for Analyses Using Gamma Spectroscopy

Gamma Ra

C.0 Completeness Checklist

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification and Counting Position
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Counts and Count Duration for Standards
✓ Efficiencies and/or Geometry and Matrix Factors
✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
✓ Kev/Channel
✓ FWHM

Blanks

✓ Detector Identification
✓ Date of Analysis
NO MDA of Method will calculate
✓ Amounts of Reagents Used in Blank
✓ Raw Data raw data for 7003-20 (QC 7548) in SDG 7003

Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analyses and Calculated Precision
✓ Raw Data data for 7003-21 (QC 7549) in SDG 7003

Radiometric and Gravimetric Yields

NA

____ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
____ Weights of Precipitates or Solids Counted
____ Calculated Recoveries

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses data for 7003-19 (QC 7547) in SDG 7003

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Supplemental Requirements for Analyses Using
Gamma Spectroscopy

C.0 Completeness Checklist I-129

Analysis Results

missing: 301DH7

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✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification and Counting Position
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Counts and Count Duration for Standards
✓ Efficiencies and/or Geometry and Matrix Factors
✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
✓ Kev/Channel
✓ FWHM

Blanks

✓ Detector Identification
✓ Date of Analysis
NO MDA of Method will calculate
✓ Amounts of Reagents Used in Blank
✓ Raw Data

Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Results of Analyses and Calculated Precision
- ✓ Raw Data

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

HCRL-WHC/9306-L-92-063

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WESTINGHOUSE HANFORD COMPANY
300-FF-5 RI DATA VALIDATION
DISTRIBUTION FORM

Document Title: Prelim. QA Records Trng Case. # N1-12-028-9573

Document Number: HCRL-WHC/9306-L-92-063 Date: 12/17/92

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Project Files (1=Adm: 2=Corres: 3=Source Information; 4=Technical Data & Products)

1.1 File Index		2.1 Incoming Correspondence		4.4.5 Biota/Small Mammals	
1.2 Distribution Lists		2.2 Outgoing Correspondence	X	4.4.6 Surface Water/Sediments	
1.3 Project Procedures		2.3 Internal Correspondence		4.5 Data Val. & Qual. Summary Rpts.	
1.4 Project Modifications				4.5.1 Round 1 Groundwater	
1.5.1 Staff Resumes		3.1 Task Order		4.5.1.1 Internal Drafts/Comments/Resol.	
1.5.2 Staff Training		3.2 Sample Lists		4.5.1.2 WHC Review Draft/Comments/Resol.	
1.5.3 Auth.-Former Site Employee		3.3 Data Validation Procedures		4.5.1.3 Final Report	
1.6.1 QA Manual		3.4 Original Chemical Data		4.5.2 Round 2 Groundwater	
1.6.2 QA Implementation		3.5 Original Radiochem Data		4.5.2.1 Internal Drafts/Comments/Resol.	
1.6.3.1 QA Audits-Deliverables				4.5.2.2 WHC Review Draft/Comments/Resol.	
1.6.3.2 QA Audits-Files		4.1 Task Plan		4.5.2.3 Final Report	
1.6.4.1 Audit Resps-Deliverables		4.2 Data Pkg. Completeness Verif.		4.5.3 Round 3 Groundwater	
1.6.4.2 Audit Resps-Files		4.2.1 Checklists - Round 1 GW		4.5.3.1 Internal Drafts/Comments/Resol.	
1.6.5 Training		4.2.2 Checklists - Round 2 GW		4.5.3.2 WHC Review Draft/Comments/Resol.	
1.6.6.1 QA Manual Doc Log		4.2.3 Checklists - Round 3 GW		4.5.3.3 Final Report	
1.6.6.2 Procedures Doc Log		4.2.4 Checklists - Round 4 GW		4.5.4 Round 4 Groundwater	
1.6.6.3 Plans Document Log		4.2.5 Checklists - Biota/Small Mam.		4.5.4.1 Internal Drafts/Comments/Resol.	
1.6.6.4 Deliverables Doc Log		4.2.6 Checklists - Surface Wtr./Sed.		4.5.4.2 WHC Review Draft/Comments/Resol.	
1.7.1 Downloads		4.3 Data Val. Calcs./Annotated DP		4.5.4.3 Final Report	
1.7.2 M-113s		4.3.1 Round 1 Groundwater		4.5.5 Biota/Small Mammals	
1.7.3 A-208s		4.3.2 Round 2 Groundwater		4.5.5.1 Internal Drafts/Comments/Resol.	
1.7.4 Budget Status		4.3.3 Round 3 Groundwater		4.5.5.2 WHC Review Draft/Comments/Resol.	
1.7.5 Invoices		4.3.4 Round 4 Groundwater		4.5.5.3 Final Report	
1.8.1 Requisitions		4.3.5 Biota/Small Mammals		4.5.6 Surface Water/Sediments	
1.9 Meeting Minutes		4.3.6 Surface Water/Sediments		4.5.6.1 Internal Drafts/Comments/Resol.	
1.10 Record of Telecons		4.4 Preliminary QA Records		4.5.6.2 WHC Review Draft/Comments/Resol.	
1.11 Progress Reports		4.4.1 Round 1 Groundwater	X	4.5.6.3 Final Report	
1.12 Subcontractor (HC)		4.4.2 Round 2 Groundwater	X	4.6 Weekly Status Reports	
		4.4.3 Round 3 Groundwater		4.7 Weekly Management Reports	
		4.4.4 Round 4 Groundwater			

11/13/92

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HARTCROWSER

Earth and Environmental Technologies

Hart Crowser, Inc.
1201 Jadwin Avenue, Suite 204
Richland, WA 99352
FAX 509.946.4203
509.946.4344

2978-50

December 17, 1992

Mr. Larry Hulstrom
Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

Subject: WHC Order No. MLW-SVV-037106
Task Order No. E-93-06
Preliminary Quality Assurance Record - 300-FF-5 RI/FS
TMA Case Number N1-12-028-9573

Dear Mr. Hulstrom:

Ebasco and Hart Crowser are pleased to provide you with the attached results of our review and validation of the subject data from the 300-FF-5 Operable Unit Remedial Investigation/Feasibility Study (RI/FS). The attached results are provided to you in partial fulfillment of Subtask 03 of our task plan dated November 6, 1992. The subject data package consisted of nine first round groundwater samples submitted for the following radiochemical analyses: gross alpha, gross beta, tritium, strontium 90, technetium 99, iodine 129, isotopic uranium, isotopic plutonium (including Pu-241), and gamma scan. The samples were analyzed by Thermo Analytical, Inc. according to requirements specified in the Analytical Laboratory Statement of Work issued by WHC. All sample results were selected for validation. These results, together with the data qualifiers which we have tentatively assigned as a result of our review, are provided in Attachment 4.

DATA QUALITY OBJECTIVES SUMMARY

Data quality objectives with the exception of precision requirements were generally met. Poor precision resulted in the qualification of all results for gross alpha, tritium, strontium 90, technetium 99, and isotopic plutonium.

MAJOR DEFICIENCIES (REJECTED DATA)

All plutonium 241 results were rejected because the minimum detectable activity (MDA) for the method was not reported and data were not provided to allow determination of the MDA by the validation team. The inability to differentiate detects from nondetects renders the results unusable.

MINOR DEFICIENCIES (OTHER QUALIFIED DATA)

The following general trends resulting in the qualification of data from multiple samples have been noted. All qualified data are discussed in Attachments 3 and 5.

Method precision consistently did not meet the validation requirement for several analyses. This trend resulted primarily from the use of replicate samples containing nondetectable levels of analyte. Poor or undetermined precision resulted in qualifying all results of the following analyses as estimated (J or UJ): gross alpha, tritium, strontium 90, technetium 99, and isotopic plutonium.

Method accuracy did not meet requirments for two analyses, gross alpha and iodine 129. All gross alpha and iodine 129 results were listed as estimated. Some thorium analysis were identified as estimated due to differences in reported and calculated results and MDAs. In addition, all technetium 99 results and one gamma scan result were qualified as estimates due to excessive holdings times. All blank results were acceptable.

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We trust that these preliminary results meet your needs. Our qualifier assignments will be finalized at the time the summary report for this sampling round is published. The final qualifiers may vary from those presented here, reflecting any trends in data quality or laboratory performance observed over the course of the 300-FF-5 RI/FS. Please contact me if you have any questions with regard to our activities.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Project Manager
HC#130:RL1552.DOC

Attachments

cc: Mark Gerboth (w/o attachments)
Jeff Grover (w/o attachments)
Westinghouse EDMC
Project File - HCRL-WHC/9306-L-92-063

9713515.0506

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides a copy of the as-received sample concentration reports. This may be a tabular summary similar to that provided in Attachment 4, or may be a copy of the laboratory reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary of all data qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

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ATTACHMENT 1

Glossary of Data Qualifiers

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ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

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

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ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

ATTACHMENT 1 DATA TABLE

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DH7 (water)	1	Gross Alpha	(-0.0392 ± 1.81)	E+00
		Gross Beta	(0.794 ± 1.62)	E+00
		^{3}H	(-1.18 ± 1.15)	E+02
		^{234}U	(8.32 ± 0.918)	E-01
		^{235}U	(5.22 ± 2.50)	E-02
		^{238}U	(7.77 ± 0.873)	E-01
		Gamma Scan:		
		^{40}K	<8.441	E+00
		^{51}Cr	<5.470	E+02
		^{60}Co	<1.172	E+00
		^{65}Zn	<2.679	E+00
		^{134}Cs	<9.344	E-01
		^{137}Cs	<6.884	E-01
		^{226}Ra	<1.477	E+00
		^{228}Th	<1.412	E+00
		^{232}Th	<3.181	E+00
B01DJ0 (water)	2	Gross Alpha	(-0.0710 ± 1.12)	E+00
		Gross Beta	(3.83 ± 1.56)	E+00
		^{3}H	(0.355 ± 1.22)	E+02
		^{90}Sr	(0.0316 ± 1.65)	E+00
		^{99}Tc	(9.96 ± 5.20)	E+00
		^{129}I	(1.43 ± 2.63)	E+00
		^{234}U	(2.30 ± 2.05)	E-02
		^{235}U	(-0.620 ± 1.24)	E-02
		^{238}U	(0.768 ± 1.02)	E-02
		^{238}Pu	(1.82 ± 7.28)	E-03
		^{239}Pu	(0 ± 3.63)	E-03
		^{241}Pu	(-1.40 ± 0.0728)	E+00
		Gamma Scan:		
		^{40}K	<2.016	E+02
		^{51}Cr	<7.086	E+03
		^{60}Co	<1.787	E+01
		^{65}Zn	<5.339	E+01
		^{134}Cs	<1.689	E+01
		^{137}Cs	<1.500	E+01
		^{226}Ra	<2.880	E+01
		^{228}Th	<2.432	E+01
		^{232}Th	<5.446	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DJ3 (water)	3	Gross Alpha	(-0.520 ± 2.09)	E+00
		Gross Beta	(6.02 ± 1.48)	E+00
		^{3}H	(-0.279 ± 1.14)	E+02
		^{90}Sr	(0 ± 1.46)	E+00
		^{99}Tc	(2.83 ± 2.77)	E+00
		^{129}I	(0.732 ± 3.08)	E+00
		^{234}U	(5.86 ± 3.71)	E-02
		^{235}U	(-0.746 ± 1.49)	E-02
		^{238}U	(5.86 ± 3.10)	E-02
		^{238}Pu	(2.22 ± 8.86)	E-03
		^{239}Pu	(2.21 ± 8.83)	E-03
		^{241}Pu	(0.163 ± 0.652)	E+00
		Gamma Scan:		
		^{40}K	<2.304	E+02
		^{51}Cr	<6.769	E+03
		^{60}Co	<1.230	E+01
		^{65}Zn	<4.039	E+01
		^{134}Cs	<1.399	E+01
		^{137}Cs	<1.310	E+01
		^{226}Ra	<2.315	E+01
		^{228}Th	<2.289	E+01
		^{232}Th	<5.239	E+01
B01DL7 (water)	4	Gross Alpha	(27.8 ± 4.60)	E+00
		Gross Beta	(29.1 ± 2.37)	E+00
		^{3}H	(5.03 ± 0.297)	E+03
		^{90}Sr	(0.257 ± 0.135)	E+00
		^{99}Tc	(7.71 ± 3.49)	E+00
		^{129}I	(0.936 ± 1.46)	E+00
		^{234}U	(2.06 ± 0.111)	E+01
		^{235}U	(1.47 ± 0.153)	E+00
		^{238}U	(1.99 ± 0.107)	E+01
		^{238}Pu	(-2.41 ± 9.64)	E-03
		^{239}Pu	(2.40 ± 4.80)	E-03
		^{241}Pu	(0.387 ± 0.774)	E+00
		Gamma Scan:		
		^{40}K	<1.273	E+02
		^{51}Cr	<3.970	E+03
		^{60}Co	<1.016	E+01
		^{65}Zn	<1.847	E+01
		^{134}Cs	<7.909	E+00
		^{137}Cs	<7.581	E+00
		^{226}Ra	<1.224	E+01
		^{228}Th	<2.755	E+01
		^{232}Th	<3.038	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DN8 (water)	5	Gross Alpha	(2.56 ± 2.54)	E+00
		Gross Beta	(34.1 ± 2.49)	E+00
		^{3}H	(0.310 ± 1.19)	E+02
		^{90}Sr	(0 ± 1.56)	E+00
		^{99}Tc	(6.27 ± 0.784)	E+01
		^{129}I	(-1.03 ± 3.18)	E+00
		^{234}U	(2.30 ± 0.215)	E+00
		^{235}U	(1.18 ± 0.494)	E-01
		^{238}U	(2.10 ± 0.203)	E+00
		^{238}Pu	(-1.75 ± 3.51)	E-03
		^{239}Pu	(3.49 ± 3.50)	E-03
		^{241}Pu	(0.848 ± 0.848)	E+00
		Gamma Scan:		
		^{40}K	<1.431	E+02
		^{51}Cr	<4.393	E+03
		^{60}Co	<9.150	E+00
		^{65}Zn	<2.642	E+01
		^{134}Cs	<9.593	E+00
		^{137}Cs	<7.911	E+00
		^{226}Ra	<1.361	E+01
		^{228}Th	<1.420	E+01
		^{232}Th	<3.669	E+01
B01DY5 (water)	6	Gross Alpha	(8.83 ± 1.69)	E+00
		Gross Beta	(12.2 ± 1.38)	E+00
		^{90}Sr	(0.253 ± 1.27)	E+00
		^{234}U	(6.47 ± 0.545)	E+00
		^{235}U	(5.39 ± 1.18)	E-01
		^{238}U	(5.86 ± 0.503)	E+00
		Gamma Scan:		
		^{40}K	<7.885	E+01
		^{51}Cr	<3.785	E+03
		^{60}Co	<7.599	E+00
		^{65}Zn	<1.853	E+01
		^{134}Cs	<7.881	E+00
		^{137}Cs	<6.583	E+00
		^{226}Ra	<1.347	E+01
		^{228}Th	<1.431	E+01
		^{232}Th	<2.804	E+01

ATTACHMENT 1 DATA TABLE (cont'd. page four)
Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DY7 (water)	7	Gross Alpha	(20.0 ± 2.75)	E+00
		Gross Beta	(30.9 ± 1.76)	E+00
		^{90}Sr	(-1.21 ± 1.71)	E+00
		^{234}U	(1.12 ± 0.0913)	E+01
		^{235}U	(7.62 ± 1.50)	E+01
		^{238}U	(1.14 ± 0.0930)	E+01
		Gamma Scan:		
		^{40}K	<9.827	E+01
		^{51}Cr	<6.407	E+03
		^{60}Co	<1.848	E+01
		^{65}Zn	<3.957	E+01
		^{134}Cs	<1.425	E+01
		^{137}Cs	<1.160	E+01
		^{226}Ra	<2.174	E+01
		^{228}Th	<3.396	E+01
		^{232}Th	<5.205	E+01
B01DY9 (water)	8	Gross Alpha	(14.3 ± 2.75)	E+00
		Gross Beta	(10.7 ± 1.37)	E+00
		^{90}Sr	(-2.29 ± 2.81)	E+00
		^{234}U	(6.82 ± 0.607)	E+00
		^{235}U	(3.41 ± 0.947)	E-01
		^{238}U	(6.71 ± 0.594)	E+00
		Gamma Scan:		
		^{40}K	<2.561	E+02
		^{51}Cr	<7.101	E+03
		^{60}Co	<1.652	E+01
		^{65}Zn	<4.142	E+01
		^{134}Cs	<1.720	E+01
		^{137}Cs	<1.379	E+01
		^{226}Ra	<2.469	E+01
		^{228}Th	<2.371	E+01
		^{232}Th	<5.549	E+01
B01DZ1 (water)	9	Gross Alpha	(6.16 ± 1.60)	E+00
		Gross Beta	(9.43 ± 1.46)	E+00
		^{90}Sr	(0.278 ± 0.368)	E+00
		^{234}U	(5.86 ± 0.529)	E+00
		^{235}U	(3.53 ± 1.00)	E-01
		^{238}U	(5.85 ± 0.522)	E+00
		Gamma Scan:		
		^{40}K	<9.270	E+01
		^{51}Cr	<4.070	E+03
		^{60}Co	<1.316	E+01
		^{65}Zn	<2.674	E+01
		^{134}Cs	<9.978	E+00
		^{137}Cs	<8.151	E+00
		^{226}Ra	<1.439	E+01
		^{228}Th	<2.867	E+01
		^{232}Th	<3.281	E+01

9713515.0514

ATTACHMENT 3

Summary of Data Qualifications

Gross Alpha (CRDL = 3 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	-0.039	UJ
BO1DJ0	-0.071	UJ
BO1DJ3	-0.520	UJ
BO1DL7	27.800	J
BO1DN8	2.560	J
BO1DY5	8.830	J
BO1DY7	20.000	J
BO1DY9	14.300	J
BO1DZ1	6.160	J

Gross Beta (CRDL = 4 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	0.794	U
BO1DJ0	3.830	
BO1DJ3	6.020	
BO1DL7	29.100	
BO1DN8	34.100	
BO1DY5	12.200	
BO1DY7	30.900	
BO1DY9	10.700	
BO1DZ1	9.430	

Tritium (CRDL = 400 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	-118.000	UJ
BO1DJ0	35.500	UJ
BO1DJ3	-27.900	UJ
BO1DL7	5030.000	J
BO1DN8	31.000	UJ
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Strontium 90 (CRDL = 2 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	0.032	UJ
BO1DJ3	0.000	UJ
BO1DL7	0.257	J
BO1DN8	0.000	UJ
BO1DY5	0.253	UJ
BO1DY7	-1.210	UJ
BO1DY9	-2.290	UJ
BO1DZ1	0.278	UJ

Tech 99 (CRDL = 15 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	9.960	UJ
BO1DJ3	2.830	UJ
BO1DL7	7.710	J
BO1DN8	62.700	J
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Iodine 129 (CRDL = 5 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	1.430	UJ
BO1DJ3	0.732	UJ
BO1DL7	0.936	UJ
BO1DN8	-1.030	UJ
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Isotopic Uranium

U234 (CRDL = 1 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	0.832	
BO1DJ0	0.023	
BO1DJ3	0.059	
BO1DL7	20.600	
BO1DN8	2.300	
BO1DY5	6.470	
BO1DY7	11.200	
BO1DY9	6.820	
BO1DZ1	5.860	

U235 (CRDL = 1 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	0.052	
BO1DJ0	-0.006	U
BO1DJ3	-0.007	U
BO1DL7	1.470	
BO1DN8	0.118	
BO1DY5	0.539	
BO1DY7	76.200	
BO1DY9	0.341	
BO1DZ1	0.353	

U238 (CRDL = 1 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	0.777	
BO1DJ0	0.008	U
BO1DJ3	0.059	
BO1DL7	19.900	
BO1DN8	2.100	
BO1DY5	5.860	
BO1DY7	11.400	
BO1DY9	6.710	
BO1DZ1	5.850	

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Isotopic Plutonium

Pu238 (CRDL = 1 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	0.002	UJ
BO1DJ3	0.002	UJ
BO1DL7	-0.002	UJ
BO1DN8	-0.002	UJ
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Pu239 (CRDL = 1 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	0.000	UJ
BO1DJ3	0.002	UJ
BO1DL7	0.002	UJ
BO1DN8	0.003	UJ
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Pu241 (CRDL = 15 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	-1.400	R
BO1DJ3	0.163	R
BO1DL7	0.387	R
BO1DN8	0.848	R
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Gamma Spec

Cobalt 60 (CRDL = 25 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	1.172	UJ
BO1DJ0	17.870	U
BO1DJ3	12.300	U
BO1DL7	10.160	U
BO1DN8	9.150	U
BO1DY5	7.599	U
BO1DY7	18.480	U
BO1DY9	16.520	U
BO1DZ1	13.160	U

Cesium 137 (CRDL = 15 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	0.688	UJ
BO1DJ0	15.000	U
BO1DJ3	13.100	U
BO1DL7	7.581	U
BO1DN8	7.911	U
BO1DY5	6.583	U
BO1DY7	11.600	U
BO1DY9	13.790	U
BO1DZ1	8.150	U

Thorium 228 (CRDL = Not reported)

Customer I.D. #	Reported Results	Q
BO1DH7	1.412	UJ
BO1DJ0	24.320	U
BO1DJ3	22.890	U
BO1DL7	27.550	U
BO1DN8	14.200	U
BO1DY5	14.300	U
BO1DY7	33.960	U
BO1DY9	23.710	U
BO1DZ1	28.670	U

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9713515.0517

ATTACHMENT 4

As Qualified Data Summary

9213515.0518

TMA

"J" due to prior preparation - [illegible]

"J" due to holding time >6 months - All Tc, B01DH7 [illegible]

"J" due to Blanks - none

ATTACHMENT 1 DATA TABLE

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DH7 (water)	1	Gross Alpha	(-0.0392 ± 1.81)	E+00
		Gross Beta	(0.794 ± 1.62)	E+00
		^{3}H	(-1.18 ± 1.15)	E+02
		^{234}U	(8.32 ± 0.918)	E-01
		^{235}U	(5.22 ± 2.50)	E-02
		^{238}U	(7.77 ± 0.873)	E-01
		>6 months Gamma Scan:		
		^{40}K	<8.441	E+00
		^{51}Cr	<5.470	E+02
		^{60}Co	<1.172	E+00
		^{65}Zn	<2.679	E+00
		^{134}Cs	<9.344	E-01
		^{137}Cs	<6.884	E-01
		^{226}Ra	<1.477	E+00
		^{228}Th	<1.412	E+00
		^{232}Th	<3.181	E+00
B01DJ0 (water)	2	Gross Alpha	(-0.0710 ± 1.12)	E+00 J
		Gross Beta	(3.83 ± 1.56)	E+00
		^{3}H	(0.355 ± 1.22)	E+02 J
		^{90}Sr	(0.0316 ± 1.65)	E+00 J
		>6 months ^{99}Tc	(9.96 ± 5.20)	E+00 J
		^{129}I	(1.43 ± 2.63)	E+00 J
		^{234}U	(2.30 ± 2.05)	E-02
		^{235}U	(-0.620 ± 1.24)	E-02
		^{238}U	(0.768 ± 1.02)	E-02
		^{238}Pu	(1.82 ± 7.28)	E-03 J
		^{239}Pu	(0 ± 3.63)	E-03 J
		^{241}Pu	(-1.40 ± 0.0728)	E+00 R
		Gamma Scan:		
		^{40}K	<2.016	E+02
		^{51}Cr	<7.086	E+03
		^{60}Co	<1.787	E+01
		^{65}Zn	<5.339	E+01
		^{134}Cs	<1.689	E+01
		^{137}Cs	<1.500	E+01
		^{226}Ra	<2.880	E+01
		^{228}Th	<2.432	E+01
		^{232}Th	<5.446	E+01

Notes

All Tc^{99} >6 months holding time

RDL - Co^{60} - 25 pCi/L

Cs^{137} 15 pCi/L

Th^{232} not Listed

* All Pu-241 results are qualified "R" - no MDA reported or calculated. Since background counting time not provided, cannot determine if detect or non detect

** one spike >120%, however all results << MDA other spike acceptable

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TMA

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DJ3 (water)	3	Gross Alpha	(-0.520 ± 2.09)	E+00
		Gross Beta	(6.02 ± 1.48)	E+00
		^{3}H	(-0.279 ± 1.14)	E+02
		^{90}Sr	(0 ± 1.46)	E+00
		> 6 months ^{99}Tc	(2.83 ± 2.77)	E+00
		^{129}I	(0.732 ± 3.08)	E+00
		^{234}U	(5.86 ± 3.71)	E-02
		^{235}U	(-0.746 ± 1.49)	E-02
		^{238}U	(5.86 ± 3.10)	E-02
		^{238}Pu	(2.22 ± 8.86)	E-03
		^{239}Pu	(2.21 ± 8.83)	E-03
		^{241}Pu	(0.163 ± 0.652)	E+00
		Gamma Scan:		
		^{40}K	<2.304	E+02
		^{51}Cr	<6.769	E+03
		^{60}Co	<1.230	E+01
		^{65}Zn	<4.039	E+01
		^{134}Cs	<1.399	E+01
		^{137}Cs	<1.310	E+01
		^{226}Ra	<2.315	E+01
		^{228}Th	<2.289	E+01
		^{232}Th	<5.239	E+01
B01DL7 (water)	4	Gross Alpha	(27.8 ± 4.60)	E+00
		Gross Beta	(29.1 ± 2.37)	E+00
		^{3}H	(5.03 ± 0.297)	E+03
		^{90}Sr	(0.257 ± 0.135)	E+00
		> 6 months ^{99}Tc	(7.71 ± 3.49)	E+00
		^{129}I	(0.936 ± 1.46)	E+00
		^{234}U	(2.06 ± 0.111)	E+01
		^{235}U	(1.47 ± 0.153)	E+00
		^{238}U	(1.99 ± 0.107)	E+01
		^{238}Pu	(-2.41 ± 9.64)	E-03
		^{239}Pu	(2.40 ± 4.80)	E-03
		^{241}Pu	(0.387 ± 0.774)	E+00
		Gamma Scan:		
		^{40}K	<1.273	E+02
		^{51}Cr	<3.970	E+03
		^{60}Co	<1.016	E+01
		^{65}Zn	<1.847	E+01
		^{134}Cs	<7.909	E+00
		^{137}Cs	<7.581	E+00
		^{226}Ra	<1.224	E+01
		^{228}Th	<2.755	E+01
		^{232}Th	<3.038	E+01

chemical yield information.

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TMA

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DN8 (water)	5	Gross Alpha	(2.56 ± 2.54)	E+00
		Gross Beta	(34.1 ± 2.49)	E+00
		^{3}H	(0.310 ± 1.19)	E+02
		^{90}Sr	(0 ± 1.56)	E+00
		>6 months ^{99}Tc	(6.27 ± 0.784)	E+01
		^{129}I	(-1.03 ± 3.18)	E+00
		^{234}U	(2.30 ± 0.215)	E+00
		^{235}U	(1.18 ± 0.494)	E-01
		^{238}U	(2.10 ± 0.203)	E+00
		^{238}Pu	(-1.75 ± 3.51)	E-03
		^{239}Pu	(3.49 ± 3.50)	E-03
		^{241}Pu	(0.848 ± 0.848)	E+00
		Gamma Scan:		
		^{40}K	<1.431	E+02
		^{51}Cr	<4.393	E+03
		^{60}Co	<9.150	E+00
		^{65}Zn	<2.642	E+01
		^{134}Cs	<9.593	E+00
		^{137}Cs	<7.911	E+00
		^{226}Ra	<1.361	E+01
		^{228}Th	<1.420	E+01
		^{232}Th	<3.669	E+01
B01DY5 (water)	6	Gross Alpha	(8.83 ± 1.69)	E+00
		Gross Beta	(12.2 ± 1.38)	E+00
		^{90}Sr	(0.253 ± 1.27)	E+00
		^{234}U	(6.47 ± 0.545)	E+00
		^{235}U	(5.39 ± 1.18)	E-01
		^{238}U	(5.86 ± 0.503)	E+00
		Gamma Scan:		
		^{40}K	<7.885	E+01
		^{51}Cr	<3.785	E+03
		^{60}Co	<7.599	E+00
		^{65}Zn	<1.853	E+01
		^{134}Cs	<7.881	E+00
		^{137}Cs	<6.583	E+00
		^{226}Ra	<1.347	E+01
		^{228}Th	<1.431	E+01
		^{232}Th	<2.804	E+01

missing chemical yield information.

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ATTACHMENT 1 DATA TABLE (cont'd, page four)

TMA

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DY7 (water)	7	Gross Alpha	(20.0 ± 2.75)	E+00
		Gross Beta	(30.9 ± 1.76)	E+00
		^{90}Sr	(-1.21 ± 1.71)	E+00
		^{234}U	(1.12 ± 0.0913)	E+01
		^{235}U	(7.62 ± 1.50)	E+01
		^{238}U	(1.14 ± 0.0930)	E+01
		Gamma Scan:		
		^{40}K	<9.827	E+01
		^{51}Cr	<6.407	E+03
		^{60}Co	<1.848	E+01
		^{65}Zn	<3.957	E+01
		^{134}Cs	<1.425	E+01
		^{137}Cs	<1.160	E+01
		^{226}Ra	<2.174	E+01
		^{228}Th	<3.396	E+01
		^{232}Th	<5.205	E+01
B01DY9 (water)	8	Gross Alpha	(14.3 ± 2.75)	E+00
		Gross Beta	(10.7 ± 1.37)	E+00
		^{90}Sr	(-2.29 ± 2.81)	E+00
		^{234}U	(6.82 ± 0.607)	E+00
		^{235}U	(3.41 ± 0.947)	E-01
		^{238}U	(6.71 ± 0.594)	E+00
		Gamma Scan:		
		^{40}K	<2.561	E+02
		^{51}Cr	<7.101	E+03
		^{60}Co	<1.652	E+01
		^{65}Zn	<4.142	E+01
		^{134}Cs	<1.720	E+01
		^{137}Cs	<1.379	E+01
		^{226}Ra	<2.469	E+01
		^{228}Th	<2.371	E+01
		^{232}Th	<5.549	E+01
B01DZ1 (water)	9	Gross Alpha	(6.16 ± 1.60)	E+00
		Gross Beta	(9.43 ± 1.46)	E+00
		^{90}Sr	(0.278 ± 0.368)	E+00
		^{234}U	(5.86 ± 0.529)	E+00
		^{235}U	(3.53 ± 1.00)	E-01
		^{238}U	(5.85 ± 0.522)	E+00
		Gamma Scan:		
		^{40}K	<9.270	E+01
		^{51}Cr	<4.070	E+03
		^{60}Co	<1.316	E+01
		^{65}Zn	<2.674	E+01
		^{134}Cs	<9.978	E+00
		^{137}Cs	<8.151	E+00
		^{226}Ra	<1.439	E+01
		^{228}Th	<2.867	E+01
		^{232}Th	<3.281	E+01

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ATTACHMENT 5

Data Review Supporting Documentation

9713515.0523

Data Package Completeness Checklists

TMA/Norcal NI-12-028-9573

B01DH7
B01DJ0
B01DJ3
B01DL7
B01DN8
B01DY5
B01DY7
B01DY9
B01DZ1

Gross α/β

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- NA Weights of Carriers Added, If Applicable
- NA Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- NA Results of Statistical Test Used to Evaluate Instrument Background
- NA Control Limits for Check Source and Background Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

_____ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
_____ Weights of Precipitates or Solids Counted
_____ Calculated Recoveries

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Aliquots of Samples
✓ Weights of Solids Counted
✓ Count Durations
✓ Sample Identifications
✓ Calculated Precision

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

SR-90

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

missing: B01DH7 (not logged in according to log-in verif.)

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- ✓ Weights of Carriers Added, If Applicable
- ✓ Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- ✓ Results of Statistical Test Used to Evaluate Instrument Background
- NA Control Limits for Check Source and Background Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- NO MDA of Method will calculate
- ✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Aliquots of Samples
- ✓ Weights of Solids Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

TC-99

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

missing: B0ID H7

B0ID H7 HAD 99TC LATER CANCELLED DATA ok

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Prepared or Counted
✓ Weights of Solids Counted

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
✓ Amount of (Check) Standard Used
✓ Raw Data including Counts and Count Duration for Standards
✓ Weights of Preparations
✓ Efficiencies
NA Weights of Carriers Added, If Applicable
NA Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
✓ Raw Data of Background Counts and Count Duration
NA Results of Statistical Test Used to Evaluate Instrument Background
NA Control Limits for Check Source and Background Counts

Blanks

✓ Detector Identification
✓ Date of Analysis
NA MDA of Method will calculate
✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Aliquots of Samples
- ✓ Weights of Solids Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

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Supplemental Requirements for the Analysis of Tritium Using Liquid Scintillation Counting

F.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration) no notebook page
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Instrument Identification
- ✓ Analysis Date and Analyst Initials
- ✓ Sample Weight

Initial and Continuing Instrument Calibration

- ✓ Instrument Identification
- ✓ Identification of Calibration Standards including Radionuclides, Certification, Issue or Expiration Date and Activity
- NA Amount of Standard Used for Calibration
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
- ✓ Counting Efficiency Determination Method and Results
- ✓ Quench Correction Method

Blanks

- ✓ Instrument Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used
- NA Lot Numbers of Reagents Used
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, Background Count Duration)
- ✓ Tritium Levels in Background Water

Duplicates

- ✓ Instrument Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- NA Amount of Spike for Spiked Duplicates

9715515.0551

✓ Raw Data (Gross Counts, Count Duration, Background Counts, and Background Count Duration)

Radiometric Yields

✓ Amount of Tritium Standard Used for Radiometric Yield Determination
✓ Radiometric Yield Calculations and Results

Laboratory Control Samples

✓ Sample Identification
✓ Instrument Identification
✓ Date of Analysis
✓ Calculated Recoveries
✓ Results of Analyses

F.1 General

Scope

This Appendix provides supplemental information used for validating analytical data from the determination of tritium in water using liquid scintillation counting.

Applicability

The validation criteria in this appendix are intended to be applied in addition to those found in the body of the procedure. In cases where discrepancies exist between the requirements of the procedure and the appendix, the criteria in the appendix shall apply.

F.2 Calibration

Liquid scintillation counting systems are calibrated using NIST traceable external or internal standards. The chemical and physical matrix of the standards should resemble the samples as closely as possible in order to match light emission (scintillation) and quenching properties.

- If the matrix of the standard is not representative of that for the samples, qualify all associated results as estimated, (J).

9715515.0552

Supplemental Requirements for the Analysis of
Pu-241 Using Liquid Scintillation Counting

F.0 Completeness Checklist

Analysis Results

missing:
B01DH7
B01DY5
B01DY7
B01DY9
B01DZ1

these were mis-marked. they should have been ~~Pu~~ Analysis data ok

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
✓ Calculation Sheets
✓ Sample Identifications
Instrument Identification
✓ Analysis Date and Analyst Initials
✓ Sample Weight

Initial and Continuing Instrument Calibration

✓ Instrument Identification
✓ Identification of Calibration Standards including Radionuclides, Certification, Issue or Expiration Date and Activity
NA Amount of Standard Used for Calibration
✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
✓ Counting Efficiency Determination Method and Results
NA Quench Correction Method

Blanks

✓ Instrument Identification
✓ Date of Analysis
NO MDA of Method will calculate
✓ Amounts of Reagents Used
NA Lot Numbers of Reagents Used
✓ Raw Data (Gross Counts, Count Duration, Background Count, Background Count Duration)
✓ ~~Tritium~~ Pu-241 Levels in Background Water

Duplicates

✓ Instrument Identification
✓ Date of Analysis
✓ Amounts of Samples
NA Amount of Spike for Spiked Duplicates

✓ Raw Data (Gross Counts, Count Duration, Background Counts, and Background Count Duration)

Radiometric Yields

✓ Amount of ~~Tritium~~ Tracer/Carrier Standard Used for Radiometric Yield Determination

✓ Radiometric Yield Calculations and Results

Laboratory Control Samples

✓ Sample Identification

✓ Instrument Identification

✓ Date of Analysis

✓ Calculated Recoveries

✓ Results of Analyses

F.1 General

Scope

This Appendix provides supplemental information used for validating analytical data from the determination of tritium in water using liquid scintillation counting.

Applicability

The validation criteria in this appendix are intended to be applied in addition to those found in the body of the procedure. In cases where discrepancies exist between the requirements of the procedure and the appendix, the criteria in the appendix shall apply.

F.2 Calibration

Liquid scintillation counting systems are calibrated using NIST traceable external or internal standards. The chemical and physical matrix of the standards should resemble the samples as closely as possible in order to match light emission (scintillation) and quenching properties.

- If the matrix of the standard is not representative of that for the samples, qualify all associated results as estimated, (J).

Iso-U

Supplemental Requirements for Analyses Using Alpha Spectroscopy

B.0 Completeness Checklist

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted (Precipitated or Deposited)

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Spectra or Counts per Channel
NA Kev/channel
NA Count Duration for Standards
✓ Efficiencies
NA Raw Data of Background Counts, Dates Counted, and Duration of Counts

Blanks

✓ Detector Identification
✓ Date of Analysis
✓ MDA of Method
✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Alpha Spectroscopy (Cont.)

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

571515.0536

Iso-Pu

Supplemental Requirements for Analyses Using Alpha Spectroscopy

B.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Spectra, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Counted (Precipitated or Deposited)

missing:
B01DH7
B01DY5
B01DY7
B01DY9
B01DZ1

Should be U(iso) Analysis Data OK?

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- NA Amount of (Check) Standard Used
- ✓ Raw Data including Spectra or Counts per Channel
- NA Kev/channel
- NA Count Duration for Standards
- ✓ Efficiencies
- NA Raw Data of Background Counts, Dates Counted, and Duration of Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used in Blank

9713515.0537

Supplemental Requirements for Analyses Using Alpha Spectroscopy (Cont.)

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

9713515.0538

Supplemental Requirements for Analyses Using
Gamma Spectroscopy

Gamma Dx

C.0 Completeness Checklist

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification and Counting Position
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Counts and Count Duration for Standards
✓ Efficiencies and/or Geometry and Matrix Factors
✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
✓ Kev/Channel
✓ FWHM

Blanks

✓ Detector Identification
✓ Date of Analysis
ND MDA of Method will calculate
✓ Amounts of Reagents Used in Blank
✓ Raw Data raw data for 7003-20 (QC 7548) in SDG 7003

Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Results of Analyses and Calculated Precision
- ✓ Raw Data data for 7003-21 (QC 7549) in SDG 7003

Radiometric and Gravimetric Yields

NA

- ____ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ____ Weights of Precipitates or Solids Counted
- ____ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses data for 7003-19 (QC 7547) in SDG 7003

Supplemental Requirements for Analyses Using
Gamma Spectroscopy

C.0 Completeness Checklist I-129

Analysis Results

missing: 301DH7 HAD 12-7-1 Dele Data of

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification and Counting Position
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
- NA Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Efficiencies and/or Geometry and Matrix Factors
- ✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
- ✓ Kev/Channel
- ✓ FWHM

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- ND MDA of Method will calculate
- ✓ Amounts of Reagents Used in Blank
- ✓ Raw Data

Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Results of Analyses and Calculated Precision
- ✓ Raw Data

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

9215515.0542

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P.O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 Fax No. (510) 235-0438

JUL 1992
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OSM DMO

July 13, 1992

SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N1-12-028-9573

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the gross alpha, gross beta, ^{3}H, ^{90}Sr, ^{99}Tc, ^{129}I, isotopic uranium, isotopic plutonium, and gamma scan results for the water samples from 300-FF-5 Location, we received 5 December 1991.

Please call if you have any questions concerning this data.

Sincerely,

D.P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Enclosures: Sections 1 through 14
Appendices

9713515.0543

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SECTION 3	QC Summary
SECTION 4	Chains-of-Custody Copies
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SECTION 6	Aliquot Information
SECTION 7	Raw Data for Gross Alpha and Gross Beta with QC Summary
SECTION 8	Raw Data for ^{3}H
SECTION 9	Raw Data for ^{90}Sr
SECTION 10	Raw Data for ^{99}Tc
SECTION 11	Raw Data for ^{129}I
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SECTION 13	Raw Data for Isotopic Plutonium
SECTION 14	Raw Data for Gamma Scan

SEE NEXT PAGE FOR APPENDICES TO BE INCLUDED IN THE DATA PACKAGE

INDEX OF APPENDICES TO BE INCLUDED IN DATA PACKAGE

9573

X	Appendix 1 :	Tritium Standard Solution Certificate and Preparation Information.
X	Appendix 2 :	Isotopic Uranium Standard Solution Certificates and Preparation Information.
X	Appendix 4 :	Preparation Log For QC Samples.
X	Appendix 5 :	Am Standard Solution Certificate and Preparation Information.
X	Appendix 6 :	^{99}Tc Standard Solution Certificate and Preparation Information.
X	Appendix 7 :	^{90}Sr Stock Solution Certificate, Preparation and Dilutions Information.
X	Appendix 8 :	Yttrium Carrier Certificate, Preparation and Dilutions Information.
X	Appendix 10 :	Gamma Scan Spike.
X	Appendix 11 :	Pu Standard Solution Certificate and Preparation Information.
X	Appendix 12 :	Continuing Calibration Data for Tritium for LSC Counters 4 and 5.
X	Appendix 13 :	I Carrier Solution Certificate and Preparation Information.
X	Appendix 15 :	Raw Data for Continuing Calibration for Beta Counters.
X	Appendix 16 :	Primary Calibration References.

9713515.0545

SECTION 1 Data Report

SECTION 2: CASE NARRATIVE

CASE NARRATIVE

1. Project 300-FF-5 water samples (TMA/Norcal Group Nos. 9573, 7003, and 9576) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B01DH7	9573-1	B01DL1	7003-6
B01DJ0	9573-2	B01F07	7003-7
B01DJ3	9573-3	B01DM9	7003-8
B01DL7	9573-4	B01DN5	7003-9
B01DN8	9573-5	B01DM6	9576-1
B01DY5	9573-6	B01DP1	9576-2
B01DY7	9573-7	B01DP4	9576-3
B01DY9	9573-8	B01DS8	9576-4
B01DZ1	9573-9	B01DZ3	9576-5
B01DT7	7003-1	B01DT1	9576-6
B01DW6	7003-2	B01DT4	9576-7
B01DX0	7003-3	B01DX3	9576-8
B01DX9	7003-4	B01DZ9	9576-9
B01F15	7003-5	B01F01	9576-10
		B01F03	9576-11
		B01DK8	9576-12

2. The analysis reported are:

WATER

Analyte Sample #	Group # & Sample #	Group # & Sample #	Group # & Sample #
Gross α & β	9573-1-9	7003-1-9	9576-1-12
^{3}H	9573-1,2,3,4, & 5	7003-1,2,3,4,6,8, & 9	9576-1 thru 9, & 11
^{90}Sr	9573-2,3,4,5,6,7,8,&9	7003-1-9	9576-1-12
^{99}Tc	9573-2,3, 4, & 5	7003-1,2,3,4,6,8, & 9	9576-1 thru 9, & 11
^{129}I	9573-2,3, 4, & 5	7003-1,2,3,4,6,8, & 9	9576-1 thru 9, & 11
Isotopic U	9573-1-9	7003-1-9	9576-1-12
Isotopic Pu	9573-2,3, 4, & 5	7003-1,3,4,6,8, & 9	9576-1 thru 9, & 11
^{241}Pu	9573-2,3, 4, & 5	7003-1,3,4,6,8, & 9	9576-1 thru 9, & 11
Gamma Scan	9573-1-9	7003-1-9	9576-1-12

3. Results are reported pCi/L with 2 σ errors.

4. The QC samples consisting of a spike, a laboratory control sample, and a replicate were processed with each batch as shown on Table 1.

9713515.0549

SECTION 3: QC SUMMARY

QUALITY CONTROL SUMMARY

Attachments 2, 3, and 4 gives the results of the QC samples. The recovery ratios were determined by the QC Officer based upon the final data obtained for each. The laboratory control samples were calculated with an aliquot of 1.00 and, therefore, the presented data cannot be compared directly with the sample data. To compare them directly, the laboratory control sample data would need to be divided by sample aliquots.

The results of the spike, laboratory control sample, and the replicate for gross alpha, gross beta, ^{3}H, ^{90}Sr, ^{99}Tc, ^{129}I, isotopic Pu, isotopic uranium, and gamma scan were satisfactory. The found/added ratio for gross alpha spikes were 0.76 ± 0.08 and 0.78 ± 0.05. The found/added ratio for ^{234}U and ^{238}U of the second spike were 0.69 ± 0.06 and 0.67 ± 0.06, respectively.

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
TMA/Norcal Program Manager

TABLE 1

Preparation Batch Samples Processed	Data Package
9573-1 through 9	- WATER
7003-1 through 9	- WATER
9576-1 through 12	- WATER

QC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9573-34 (QC 7514)	Spike	Gross α,β	X
9573-35 (QC 7515)	Spike	Gross α,β	X
7003-16 (QC 7544)	Spike	Gross α,β	X
9573-36 (QC 7516)	LCS	Gross α,β	X
9573-37 (QC 7517)	LCS	Gross α,β	X
7003-17 (QC 7545)	LCS	Gross α,β	X
9573-38 (QC 7518)	Replicate	Gross α,β	X
9573-39 (QC 7519)	Replicate	Gross α,β	X
7003-18 (QC 7546)	Replicate	Gross α,β	X
9573-52 (QC 7532)	Spike	^{3}H	X
9573-53 (QC 7533)	Spike	^{3}H	X
9573-54 (QC 7534)	LCS	^{3}H	X
9573-55 (QC 7535)	LCS	^{3}H	X
9573-56 (QC 7536)	Replicate	^{3}H	X
9573-57 (QC 7537)	Replicate	^{3}H	X
9573-10 (QC 7508)	Spike	^{90}Sr	X
9573-11 (QC 7509)	Spike	^{90}Sr	X
7003-13 (QC 7541)	Spike	^{90}Sr	X
9573-12 (QC 7492)	LCS	^{90}Sr	X
9574-13 (QC 7493)	LCS	^{90}Sr	X
7003-14 (QC 7542)	LCS	^{90}Sr	X
9573-14 (QC 7494)	Replicate	^{90}Sr	X
9573-15 (QC 7495)	Replicate	^{90}Sr	X
7003-15 (QC 7543)	Replicate	^{90}Sr	X
9573-22 (QC 7502)	Spike	^{99}Tc	X
9573-23 (QC 7503)	Spike	^{99}Tc	X
9573-24 (QC 7504)	LCS	^{99}Tc	X
9573-25 (QC 7505)	LCS	^{99}Tc	X
9573-26 (QC 7506)	Replicate	^{99}Tc	X
9573-27 (QC 7507)	Replicate	^{99}Tc	X
9573-40 (QC 7520)	Spike	^{129}I	X
9573-41 (QC 7521)	Spike	^{129}I	X
9573-42 (QC 7522)	LCS	^{129}I	X
9573-43 (QC 7523)	LCS	^{129}I	X
9573-44 (QC 7524)	Replicate	^{129}I	X
9573-45 (QC 7525)	Replicate	^{129}I	X

QC SAMPLES PROCESSED: (cont'd.)

Sample I.D.	Type	Analyses	Reported with Data Package
9573-16 (QC 7496)	Spike	Isotopic U	X
9573-17 (QC 7497)	Spike	Isotopic U	X
7003-10 (QC 7538)	Spike	Isotopic U	X
9573-18 (QC 7498)	LCS	Isotopic U	X
9573-19 (QC 7499)	LCS	Isotopic U	X
7003-11 (QC 7539)	LCS	Isotopic U	X
9573-21 (QC 7501)	Replicate	Isotopic U	X
7003-12 (QC 7540)	Replicate	Isotopic U	X
9573-10 (QC 7490)	Spike	Isotopic Pu	X
9573-11 (QC 7491)	Spike	Isotopic Pu	X
9573-58 (QC 7667)	Spike	Isotopic Pu	X
9573-12 (QC 7492)	LCS	Isotopic Pu	X
9573-59 (QC 7668)	LCS	Isotopic Pu	X
9573-14 (QC 7494)	Replicate	Isotopic Pu	X
9573-15 (QC 7495)	Replicate	Isotopic Pu	X
9573-60 (QC 7669)	Replicate	Isotopic Pu	X
9573-46 (QC 7526)	Spike	Gamma Scan	X
9573-47 (QC 7527)	Spike	Gamma Scan	X
7003-19 (QC 7547)	Spike	Gamma Scan	X →
9573-48 (QC 7528)	LCS	Gamma Scan	X
9573-49 (QC 7529)	LCS	Gamma Scan	X
7003-20 (QC 7548)	LCS	Gamma Scan	X →
9573-50 (QC 7530)	Replicate	Gamma Scan	X
9573-51 (QC 7531)	Replicate	Gamma Scan	X
7003-21 (QC 7549)	Replicate	Gamma Scan	X →

missing raw counting data in [illegible]

6. Analysis, reanalysis, and reworks, etc.

Gross Alpha and Gross Beta Analyses: The results of the spike, the laboratory control sample were satisfactory, except for gross alpha spikes. The found/added ratio for gross alpha spikes were 0.76 ± 0.08 and 0.78 ± 0.05. No abnormalties were encountered.

Strontium Analyses: The average yield for 29 analyses was 60%. The lowest yield was 25% and the highest was 83%. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered. The spike and the LCS were switched in the Lab and the results of the switched samples were satisfactory.

Isotopic Pu Analyses: The average yield for 20 analyses was 81%. The lowest yield was 34% and the highest was 103%. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Technetium Analyses: The average yield for 21 analyses was 47%. The lowest yield was 14% and the highest was 79%. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Gamma Scan Analyses: The spike sample processed had ^{60}Co and ^{137}Cs activities and the found/added ratio of the spike look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Ttitium Analyses: The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Isotopic Uranium Analyses: The average yield for 30 analyses was 61%. The lowest yield was 38% and the highest was 89%. The results of one spike, the laboratory control sample and the replicate were satisfactory. No abnormalities were encountered. The found/added ratio for ^{234}U and ^{238}U of the second spike were 0.69 ± 0.06 and 0.67 ± 0.06.

Iodine-129 Analyses: The average yield for 21 analyses was 62%. The lowest yield was 40% and the highest was 72%. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

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TMA

ATTACHMENT 2 QUALITY CONTROL SAMPLE RESULTS, SPIKES AND BLANKS

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ	
Spikes:					
9573-34					
QC-7514	Gross Alpha	(15.0 ± 1.33) E+00	(19.84 ± 0.79) E+00	0.76 ± 0.08	J
	Gross Beta	(18.8 ± 1.00) E+00	(20.37 ± 0.81) E+00	0.92 ± 0.06	ok
9573-35					
QC-7515	Gross Alpha	(15.5 ± 0.947) E+00	(19.84 ± 0.79) E+00	0.78 ± 0.05	J
	Gross Beta	(14.8 ± 0.659) E+00	(16.29 ± 0.65) E+00	0.91 ± 0.05	ok
7003-16					
QC-7544	Gross Alpha	(20.2 ± 1.53) E+00	(19.84 ± 0.79) E+00	1.02 ± 0.09	ok
	Gross Beta	(18.7 ± 0.992) E+00	(17.92 ± 0.717) E+00	1.04 ± 0.07	ok
9573-52					
QC-7532	^{3}H	(1.26 ± 0.0645) E+02	(1.17 ± 0.0468) E+02	1.07 ± 0.08	ok
9573-53					
QC-7533	^{3}H	(1.07 ± 0.0614) E+02	(0.937 ± 0.0375) E+02	1.15 ± 0.08	ok
9573-10					
QC-~~7508~~ 7495	^{90}Sr	(6.04 ± 0.926) E+00	(5.99 ± 0.239) E+00	1.01 ± 0.16	ok
9573-11					
QC-~~7509~~ 7491	^{90}Sr	(-0.239 ± 0.330) E+00	(5.13 ± 0.205) E+00	-0.047 ± 0.0649*	Do not use
7003-13					
QC-7541	^{90}Sr	(5.52 ± 0.361) E+00	(5.98 ± 0.239) E+00	0.92 ± 0.07	ok
9573-22					
QC-7502	^{99}Tc	(4.28 ± 0.353) E+01	(4.08 ± 0.163) E+01	1.05 ± 0.09	ok
9573-23					
QC-7503	^{99}Tc	(4.39 ± 0.259) E+01	(4.59 ± 0.184) E+01	0.96 ± 0.07	ok
9573-40					
QC-7520	^{129}I	(13.8 ± 1.58) E+00	(12.60 ± 0.50) E+00	1.09 ± 0.13	ok
9573-41					
QC-7521	^{129}I	(1.80 ± 0.0821) E+01	(1.470 ± 0.0588) E+01	1.22 ± 0.07	R
9573-16					
QC-7496	^{234}U	(3.74 ± 0.314) E+00	(5.43 ± 0.217) E+00	0.69 ± 0.06	J
	^{235}U	(2.59 ± 0.705) E-01	(2.59 ± 0.705) E-01	1.04 ± 0.29	ok
	^{238}U	(3.66 ± 0.305) E+00	(5.43 ± 0.217) E+00	0.67 ± 0.06	J
9573-17					
QC-7497	^{234}U	(4.07 ± 0.351) E+00	(4.34 ± 0.174) E+00	0.94 ± 0.08	ok
	^{235}U	(2.52 ± 0.695) E-01	(1.99 ± 0.159) E-01	1.27 ± 0.37	R
	^{238}U	(4.18 ± 0.356) E+00	(4.34 ± 0.174) E+00	0.96 ± 0.09	ok
7003-10					
QC-7538	^{234}U	(4.77 ± 0.395) E+00	(4.78 ± 0.191) E+00	1.00 ± 0.09	ok
	^{235}U	(0.203 ± 0.0686) E+00	(0.219 ± 0.018) E+00	0.93 ± 0.32	ok
	^{238}U	(4.86 ± 0.399) E+00	(4.78 ± 0.191) E+00	1.02 ± 0.09	ok

1. All checked against MDAs - All greater than MDA except Pu^{241} - no info. to compare.
2. Meets criteria of at least one per SDG

ATTACHMENT 2 QUALITY CONTROL SAMPLE RESULTS, SPIKES AND BLANKS (cont'd, page two) TMA

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ
9573-10				
QC-7490	^{238}Pu	(3.22 ± 0.280) E+00	(3.31 ± 0.17) E+00	0.98 ± 0.10
	^{239}Pu	(2.55 ± 0.234) E+00	(2.70 ± 0.11) E+00	0.94 ± 0.09
	^{241}Pu	(5.83 ± 0.606) E+01	(6.19 ± 0.247) E+01	0.94 ± 0.10
9573-11				
QC-7491	^{238}Pu	(2.76 ± 0.220) E+00	(2.65 ± 0.106) E+00	1.05 ± 0.09
	^{239}Pu	(2.71 ± 0.215) E+00	(2.70 ± 0.11) E+00	1.00 ± 0.09
	^{241}Pu	(6.62 ± 0.595) E+01	(6.19 ± 0.247) E+00	1.07 ± 0.11
9573-58				
QC-7667	^{238}Pu	(3.28 ± 0.187) E+00	(3.31 ± 0.132) E+00	0.99 ± 0.07
	^{239}Pu	(3.11 ± 0.180) E+00	(3.24 ± 0.130) E+00	0.96 ± 0.07
	^{241}Pu	(6.67 ± 0.440) E+01	(6.19 ± 0.247) E+01	1.08 ± 0.09
9573-46				
QC-7526	Gamma Scan:			
	^{60}Co	(6.249 ± 0.894) E+01	(6.719 ± 0.269) E+01	0.93 ± 0.14
	^{137}Cs	(6.447 ± 0.767) E+01	(6.273 ± 0.251) E+01	1.03 ± 0.13
9573-47				
QC-7527	Gamma Scan:			
	^{60}Co	(3.846 ± 1.110) E+01	(5.375 ± 0.215) E+01	0.72 ± 0.21
	^{137}Cs	(6.604 ± 0.921) E+01	(6.272 ± 0.251) E+01	1.05 ± 0.15
7003-19				
QC-7547	Gamma Scan:			
	^{60}Co	(4.883 ± 0.761) E+01	(5.387 ± 0.215) E+01	0.91 ± 0.14
	^{137}Cs	(8.269 ± 0.730) E+01	(8.364 ± 0.335) E+01	0.99 ± 0.10

* Samples 9573-11 and 9573-13 for ^{90}Sr were switched in the lab.

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found		Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples:				Blanks	
9573-36					
QC-7516	Gross Alpha	(-0.045 ± 0.23)	E+00	0	Satisfactory
	Gross Beta	(-0.00670 ± 0.333)	E+00	0	Satisfactory
9573-37					
QC-7517	Gross Alpha	(-0.0606 ± 0.154)	E+00	0	Satisfactory
	Gross Beta	(0.0500 ± 0.251)	E+00	0	Satisfactory
7003-17					
QC-7545	Gross Alpha	(0.0310 ± 0.214)	E+00	0	Satisfactory
	Gross Beta	(-1.180 ± 0.407)	E+00	0	Satisfactory
9573-54					
QC-7534	^{3}H	(-0.790 ± 2.31)	E+00	0	Satisfactory
9573-55					
QC-7535	^{3}H	(1.09 ± 2.50)	E+00	0	Satisfactory
9573-12					
QC-7492	^{90}Sr	(-0.930 ± 1.76)	E+00	0	Satisfactory
9573-13					
QC-7493	^{90}Sr	(4.46 ± 1.41)	E+00	0	Satisfactory* Doubtful
7003-14					
QC-7542	^{90}Sr	(-0.0480 ± 0.166)	E+00	0	Satisfactory
9573-24					
QC-7504	^{99}Tc	(0.318 ± 0.738)	E+00	0	Satisfactory
9573-25					
QC-7505	^{99}Tc	(2.10 ± 0.879)	E+00	0	Satisfactory
9573-42					
QC-7522	^{129}I	(0.817 ± 1.37)	E+00	0	Satisfactory
9573-43					
QC-7523	^{129}I	(-0.438 ± 1.01)	E+00	0	Satisfactory
9573-18					
QC-7498	^{234}U	(-0.676 ± 0.406)	E-02	0	Satisfactory
	^{235}U	(0.818 ± 1.64)	E-02	0	Satisfactory
	^{238}U	(2.70 ± 4.06)	E-02	0	Satisfactory
9573-19					
QC-7499	^{234}U	(1.24 ± 3.31)	E-02	0	Satisfactory
	^{235}U	(0 ± 2.01)	E-02	0	Satisfactory
	^{238}U	(2.49 ± 2.49)	E-02	0	Satisfactory
7003-11					
QC-7539	^{234}U	(-0.0137 ± 0.0137)	E+00	0	Satisfactory
	^{235}U	(0.0125 ± 0.0166)	E+00	0	Satisfactory
	^{238}U	(0.00686 ± 0.0137)	E-00	0	Satisfactory

* Samples 9573-11 and 9573-13 for ^{90}Sr were switched in the lab.
meets criteria of at least one/SDG

ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, LABORATORY CONTROL SAMPLES (cont'd, page 2)

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found		Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples:					
9573-12					
QC-7492	^{238}Pu	(1.45 ± 4.85)	E-02	0	Satisfactory
	^{239}Pu	(-0.970 ± 2.91)	E-02	0	Satisfactory
	^{241}Pu	(0.650 ± 1.95)	E+00	0	Satisfactory
9573-59					
QC-7668	^{238}Pu	(-1.17 ± 2.35)	E-03	0	Satisfactory
	^{239}Pu	(0 ± 2.35)	E-03	0	Satisfactory
	^{241}Pu	(0.0568 ± 0.0024)	E+00	0	Satisfactory
9573-48					
QC-7528	Gamma Scan:				
	^{40}K	<1.191	E+02	0	Satisfactory
	^{51}Cr	<3.887	E+01	0	Satisfactory
	^{60}Co	<7.958	E+00	0	Satisfactory
	^{65}Zn	<1.306	E+01	0	Satisfactory
	^{134}Cs	<6.271	E+00	0	Satisfactory
	^{137}Cs	<7.343	E+00	0	Satisfactory
	^{226}Ra	<1.291	E+01	0	Satisfactory
	^{228}Th	<1.522	E+01	0	Satisfactory
	^{232}Th	<3.194	E+01	0	Satisfactory
9573-49					
QC-7529	Gamma Scan:				
	^{40}K	<5.305	E+01	0	Satisfactory
	^{51}Cr	<3.209	E+01	0	Satisfactory
	^{60}Co	<7.299	E+00	0	Satisfactory
	^{65}Zn	<1.027	E+01	0	Satisfactory
	^{134}Cs	<5.411	E+00	0	Satisfactory
	^{137}Cs	<5.427	E+00	0	Satisfactory
	^{226}Ra	<9.716	E+00	0	Satisfactory
	^{228}Th	<8.304	E+00	0	Satisfactory
	^{232}Th	<2.511	E+01	0	Satisfactory
7003-20					
QC-7548	Gamma Scan:				
	^{40}K	<8.367	E+01	0	Satisfactory
	^{51}Cr	<2.871	E+01	0	Satisfactory
	^{60}Co	<5.273	E+00	0	Satisfactory
	^{65}Zn	<8.546	E+00	0	Satisfactory
	^{134}Cs	<4.958	E+00	0	Satisfactory
	^{137}Cs	<4.803	E+00	0	Satisfactory
	^{226}Ra	<8.815	E+00	0	Satisfactory
	^{228}Th	<7.158	E+00	0	Satisfactory
	^{232}Th	<1.996	E+00	0	Satisfactory

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES

Nuclide	Results pCi/L ± error 2 σ	
	No. 9573-38 Replicate	No. 9573-2 Original
QC 7518		
Gross Alpha	(-0.400 ± 1.43) E+00	(-0.0710 ± 1.12) E+00
Gross Beta	(4.42 ± 1.37) E+00	(3.83 ± 1.56) E+00
	No. 9573-39 Replicate	No. 9573-3 Original
QC 7519		
Gross Alpha	(-0.277 ± 0.992) E+00	(-0.520 ± 2.09) E+00
Gross Beta	(4.17 ± 1.15) E+00	(6.02 ± 1.48) E+00
	No. 7003-18 Replicate	No. 7003-5 Original
QC 7546		
Gross Alpha	(13.3 ± 2.98) E+00	(6.85 ± 3.04) E+00
Gross Beta	(18.1 ± 2.02) E+00	(12.1 ± 1.77) E+00
	No. 9573-56 Replicate	No. 9573-2 Original
QC 7536		
^{3}H	(-1.14 ± 1.15) E+02	(0.355 ± 1.22) E+02
	No. 9573-57 Replicate	No. 9573-3 Original
QC 7537		
^{3}H	(0.199 ± 1.34) E+02	(-0.279 ± 1.14) E+02
	No. 9573-14 Replicate	No. 9573-2 Original
QC 7494		
^{90}Sr	(-0.0407 ± 0.172) E+00	(0.0316 ± 1.65) E+00
	No. 9573-15 Replicate	No. 9573-3 Original
QC 7495		
^{90}Sr	(-0.154 ± 0.454) E+00	(0.0 ± 1.46) E+00
	No. 7003-15 Replicate	No. 7003-5 Original
QC 7543		
^{90}Sr	(0.272 ± 0.357) E+00	(0.190 ± 1.62) E+00
	No. 9573-26 Replicate	No. 9573-2 Original
QC 7506		
^{99}Tc	(1.65 ± 1.90) E+00	(9.96 ± 5.20) E+00
	No. 9573-27 Replicate	No. 9573-3 Original
QC 7507		
^{99}Tc	(-0.603 ± 2.96) E+00	(2.83 ± 2.77) E+00

Continued on Separate Sheet

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES (cont'd, page two)

Nuclide	Results pCi/L ± error 2 σ	
	No. 9573-44 Replicate	No. 9573-2 Original
QC 7524		
^{129}I	(0.110 ± 3.35) E+00	(1.43 ± 2.63) E+00
	No. 9573-45 Replicate	No. 9573-3 Original
QC 7525		
^{129}I	(2.52 ± 2.33) E+00	(0.732 ± 3.08) E+00
	No. 9573-21 Replicate	No. 9573-3 Original
QC 7501		
^{234}U	(6.78 ± 1.08) E-01	(5.86 ± 3.71) E-02
^{235}U	(5.68 ± 3.51) E-02	(-0.746 ± 1.49) E-02
^{238}U	(6.85 ± 1.08) E-01	(5.86 ± 3.10) E-02
	No. 7003-12 Replicate	No. 7003-5 Original
QC 7540		
^{234}U	(8.90 ± 0.714) E+00	(6.75 ± 0.458) E+00
^{235}U	(7.93 ± 1.50) E-01	(6.82 ± 1.05) E-01
^{238}U	(8.55 ± 0.690) E+00	(5.96 ± 0.417) E+00
	No. 9573-14 Replicate	No. 9573-2 Original
QC 7494		
^{238}Pu	(-1.91 ± 7.63) E-03	(1.82 ± 7.28) E-03
^{239}Pu	(3.80 ± 7.61) E-03	(0 ± 3.63) E-03
^{241}Pu	(-2.08 ± 5.90) E+00	(-1.40 ± 0.0287) E+00
	No. 9573-15 Replicate	No. 9573-3 Original
QC 7495		
^{238}Pu	(-1.04 ± 6.25) E-02	(2.22 ± 8.86) E-03
^{239}Pu	(-3.11 ± 4.17) E-02	(2.21 ± 8.83) E-03
^{241}Pu	(-13.94 ± 33.59) E+00	(0.163 ± 0.652) E+00
	No. 9573-60 Replicate	No. 9573-4 Original
QC 7669		
^{238}Pu	(1.15 ± 4.59) E-03	(-2.41 ± 9.64) E-03
^{239}Pu	(2.29 ± 4.58) E-03	(2.40 ± 4.80) E-03
^{241}Pu	(-1.45 ± 2.89) E+00	(0.387 ± 0.774) E+00

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES (cont'd, page three)

Nuclide	Results pCi/L ± error 2 σ			
	No. 9573-50 Replicate		No. 9573-2 Original	
QC-7530				
Gamma Scan:				
^{40}K	<2.309	E+02	<2.016	E+02
^{51}Cr	<7.084	E+03	<7.086	E+03
^{60}Co	<1.608	E+01	<1.787	E+01
^{65}Zn	<4.054	E+01	<5.339	E+01
^{134}Cs	<1.541	E+01	<1.689	E+01
^{137}Cs	<1.451	E+01	<1.500	E+01
^{226}Ra	<2.141	E+01	<2.880	E+01
^{228}Th	<2.139	E+01	<2.432	E+01
^{232}Th	<5.004	E+01	<5.446	E+01
	No. 9573-51 Replicate		No. 9573-3 Original	
QC-7531				
Gamma Scan:				
^{40}K	<1.067	E+02	<2.304	E+02
^{51}Cr	<6.563	E+03	<6.769	E+03
^{60}Co	<1.654	E+01	<1.230	E+01
^{65}Zn	<3.956	E+01	<4.039	E+01
^{134}Cs	<1.371	E+01	<1.399	E+01
^{137}Cs	<9.731	E+00	<1.310	E+01
^{226}Ra	<2.889	E+01	<2.315	E+01
^{228}Th	<3.459	E+01	<2.289	E+01
^{232}Th	<5.045	E+01	<5.239	E+01
	No. 7003-21 Replicate		No. 7003-5 Original	
QC-7549				
Gamma Scan:				
^{40}K	<1.506	E+02	<1.209	E+02
^{51}Cr	<5.374	E+03	<4.725	E+03
^{60}Co	<1.946	E+01	<1.679	E+01
^{65}Zn	<4.325	E+01	<3.243	E+01
^{134}Cs	<1.136	E+01	<1.334	E+01
^{137}Cs	<1.080	E+01	<1.148	E+01
^{226}Ra	<2.281	E+01	<2.199	E+01
^{228}Th	<2.387	E+01	<1.814	E+01
^{232}Th	<4.614	E+01	<3.989	E+01

NOTES TO QC RESULTS

(1) Sample 9573-13 is an aliquot of 7014-1, however, for QC batching convenience it was given group 9573 designation.

(2) Sample 9573-10 is an aliquot of 7006-1, however, for QC batching convenience it was given group 9573 designation.

(3) Sample 9573-16 is an aliquot of 9562-2, however, for QC batching convenience it was given group 9573 designation.

9713515.0561

SECTION 4: COPIES OF CHAINS-OF-CUSTODY

9713515.0562

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-2-91

Ice Chest No. FIFE

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 247425882-5 ~~247425538-14~~ PMB 12/4/91

Offsite Property No. W92-0-0035-49

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PMB 12/3/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DH7

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DH8

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
L.D. Walker L.D. Walker	PH Butcher PH Butcher	12/3/91 0700
PH Butcher PH Butcher	Kermit Blum	12-5-91 1130

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 9713515.0563

SAMPLE ANALYSIS REQUEST

TASK # 91-097

PART I: FIELD SECTION

olle r LD WALKER/KD LEE _____ Date Sampled _____ Time _____ hours

ompany Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01DH7	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRITIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129
			Tc-99, U-ISOTOPIC (HNO3)
B01DH8	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
	3, 40ml, Ag	W	CLP-VOA

eld Information** BOL#: ~~2474995781~~ 2474253825 OPC#: W92-0-0035 #49

ecial Handling and/or Storage N/A

ossible Sample Hazards

PART II: LABORATORY SECTION

ec d by Kermit Blum Title Sample Control Supervisor Date 12-5-91

nalysis Required

Indicate whether sample is soil, sludge, water, etc.

*Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0564

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/2/91

Ice Chest No. #10

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 247435282-5 ~~247435514~~ DAB 12/4/91

Offsite Property No. W92- 0-0035-UE

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PHB 12/5/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DJ0

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DJ1

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: L.D. Walker, L.D. Walker	Received by: PHButcher PHButcher	Date/Time: 12/3/91 0700
Relinquished by: PHButcher PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713515.0565

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

TASK # 91-097

PART I: FIELD SECTION

Collector LD WALKER/KD LEE Date Sampled 12/2/91 Time 1245 hours

Company Contact PH BUTCHER Telephone (509) ~~376-6165~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01DJ0	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRITIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129
			Tc-99, UNISOTOPIC (HNO3)
B01DJ1	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
	3, 40ml, Ag	W	CLP-VOA

Field Information** BOL#: ~~[illegible]~~ 247425222-5 PHB 12/4/91 OPC#: 092-0-0035-48

Special Handling and/or Storage N/A

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0566

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/2/91

Ice Chest No. SMC-16 2474352222-5

Field Logbook No. EFL-1004 Pg. 1

Bill of Lading/Airbill No. ~~2474352814~~ PHB 12/4/91

Offsite Property No. W92-0-0035-46

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PHB 12/7/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DJ3

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DJ4

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

B01FG0 3, 40ml, G, WATER, CLP-VOA

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: Kirby D. Lee Kirby Lee	Received by: PHButcher PHButcher	Date/Time: 12/2/91 0700 PHB 12/3/91
Relinquished by: PHButcher PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713515.0567

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

TASK # 91-097

PART I: FIELD SECTION

oll/ r LD WALKER/KD LEE Date Sampled 12/5/91 Time 0948 hours

ompany Contact PH BUTCHER Telephone (509) ~~376-6165~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
301D33	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	[redacted]
	1, 10 L, P	W	GROSS [redacted] SCAN, Sr-90,
			[redacted]-238/239, Pu-241, [redacted]-60, Cs-137, I-129
			[redacted]-99, [redacted]ISOTOPIC* (HNO3)
301D34	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
301F60	3, 40ml, Ag	W	CLP-VOA

eld Information** BOL#: W99-0-0035-48 OPC#: ~~{44-4353811~~ 247983769-5 12/4/91

ecial Handling and/or Storage N/A

ssible Sample Hazards

PART II: LABORATORY SECTION

ec d by Kermit Blum Title Sample Control Supervisor Date 12-5-91

nalysis Required

Indicate whether sample is soil, sludge, water, etc.

*Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0568

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-3-91

Ice Chest No. Del+9-2

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 2474255889:5

Offsite Property No. W92-D-0035-52

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PHB 12/4/91

Possible Sample Hazards/Remarks N/A

Sample Identification

BO 1DL7

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

BO 1DL8

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
L.D. Walker	PHButcher	12/4/91 0800
PHButcher	Kermit Blum	12-5-91 1130

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713515.0569

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

TASK # 91-097

PART I: FIELD SECTION

olle r LD WALKER/KD LEE Date Sampled 12/3/91 Time 1145 hours

ompany Contact PH BUTCHER Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
301DL7	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	[redacted]IUM*
	1, 10 L, P	W	GROSS [redacted]/BETA, [redacted] SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129
			Tc-99, U-[redacted]OPIC (HNO3)
301DL8	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
	3, 40ml, Ag	W	CLP-VOA

eld Information** BOL#: 247425282-5 OPC#: W92-0-0035-52

ecial Handling and/or Storage N/A

ossible Sample Hazards

PART II: LABORATORY SECTION

ec d by Kermit Blum Title Sample Control Supervisor Date 12-5-91

nalysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0570

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/3/91

Ice Chest No. #64

Field Logbook No.

Bill of Lading/Airbill No. 247425282-5

Offsite Property No. W92- 0-0035-52

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA 12/3/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DN8

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DN9

~~B01DN8~~

PPB 12/2/91 1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

B01F61, 3, 40ml, G, water, CLP-VOA

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: Kirk A. Lee K.D. Lee	Received by: PHButcher PHButcher	Date/Time: 12/4/91 0800 12/3/91 1500
Relinquished by: PHButcher PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 971351 5.0571

SAMPLE ANALYSIS REQUEST

TASK # 91-097

PART I: FIELD SECTION

oll or LD WALKER/KD LEE Date Sampled 12/3/91 Time 0802 hours

ompany Contact PH BUTCHER Telephone (509) ~~376-6165~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
301DN8	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	~~TRITIUM~~
	1, 10 L, P	W	GROSS ~~ALPHA/BETA, GAMMA~~ SCAN, ~~Sr-90~~
			~~Pu-238/239~~, Pu-241, Co-60, Cs-137, ~~I-129~~
			~~Tc-99, U ISOTOPIC~~ (HNO3)
301DN9	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
301F61	3, 40ml, Ag	W	CLP-VOA

eld Information** BOL#: 247495282-5 OPC#: W92-0-0035-52

ecial Handling and/or Storage N/A

ossible Sample Hazards

PART II: LABORATORY SECTION

ec d by Kermit Blum Title Sample Control Supervisor Date 12-5-91

nalysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0572

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/3/91

Ice Chest No. Happy

Field Logbook No. EFL-1066 pg 2

Bill of Lading/Airbill No. 24.495882-5

Offsite Property No. W92- 0-0035-50

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DY5

- 1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
- 3, 40ml, aG, WATER, CLP-VOA
- LW 12-3-91 1 ~~3~~, 1L, aG, WATER, CLP-PEST/PCB's
- 1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
- 1, 250ml, P, WATER, AMMONIA (H2SO4)
- 1, 125ml, P, WATER, pH
- 2, 4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238, Co-60, Cs-137 (HNO3) LW 12-3-91

B01DY6

- 1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: Kirby D. Lee K.D. Lee	Received by: PHButcher PHButcher	Date/Time: 12/4/91 0700 12/3/91 1510
Relinquished by: PHButcher PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 9713515.0573

SAMPLE ANALYSIS REQUEST

Task #: 4-5-7

PART I: FIELD SECTION

Collector: KD Lee / LD Walker Date Sampled: 12/3/91 Time: 1047 hours

Company Contact: ~~B. H. Ford~~ PH Butcher Telephone: (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~300~~ B01DY5	1, 1L, P	W	ICP/AA Metals (HNO_3) Unfiltered
~~300~~	3, 40ml aG	W	CLP VOA
	1, 1L, aG	W	CLP - Pest/PCB
	1, 500ml P	W	Anions (F, NO_2, NO_3) ($ZnAC + NaOH$)
	1, 1250ml P	W	Ammonia (H_2SO_4)
	1, 125ml P	W	pH
	2, 4L P	W	Gross Alpha/Beta, Sr-90, Pu-239, Pu-238, Co-60, Cs-137 (HNO_3)
B01DY6	1, 1L, P	W	ICP/AA Metals (HNO_3) Filtered

Field Information**: BOL # 24T425783-5 DPC # W92-0-0035-50

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by: Kermit Blum Title: Sample Control Supervisor Date: 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

A 5000 406 (05/90)

9713515.0574

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-3-91

Ice Chest No. SML-31

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 247425880-5

Offsite Property No. W92-0-0035-50

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DY7

1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
LW 12-3-91 1 ~~3,~~ 1L, aG, WATER, CLP-PEST/PCB's
1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
1, 250ml, P, WATER, AMMONIA (H2SO4)
1, 125ml, P, WATER, pH
W 12-3-91 2,4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238, Co-60, Cs-137 (HNO3)

B01DY8

1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: L.D. Walker L.D. Walker	Received by: PH Butcher PH Butcher	Date/Time: 12/4/91 0800
Relinquished by: PH Butcher PH Butcher	Received by: Kermit Blum	Date/Time: 12-5-91 11:30
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713515.0575

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST Task # 91-097

PART I: FIELD SECTION

Collector KD Lee / LD Walker Date Sampled 12-3-91 Time 1245 hours

Company Contact ~~B. H. Ford~~ PA Kutcher Telephone (509) 376-~~6465~~ 5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~00~~ B01DY7	1, 1L P	W	ICP/AA Metals (HNO3) Unfiltered
~~00~~	3, 40ml aG	W	CLP VOA
	1, 1L, aG	W	CLP-Pest/PCB
	1, 500ml P	W	Anions (F, NO3, NO2) (ZnAC+NaOH)
	1, 1250ml P	W	Ammonia (H2SO4)
	1, 125ml P	W	pH
	2, 4L P	W	Gross Alpha/Beta, Sr-90, Pu-239, Pu-238, Co-60, Cs-137 (HNO3)
B01DY8	1, 1L P	W	ICP/AA Metals (HNO3) Filtered

Field Information** BOL # 247425988-5 DPC # 6197-0-0035-50

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

9713515.0576

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-3-91

Ice Chest No. SML-34

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 247435282-5

Offsite Property No. W92-0-0035-51

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DY9

1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
LW 12-3-91 1 ~~3~~, 1L, aG, WATER, CLP-PEST/PCB's
1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
1, 250ml, P, WATER, AMMONIA (H2SO4)
1, 125ml, P, WATER, pH
2, 4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238, Co-60, Cs-137 (HNO3)
LW 12-3-91

B01DZ0

1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: L.D. Walker L.D. Walker	Received by: P.H. Butcher P.H. Butcher	Date/Time: 12/4/91 0800
Relinquished by: P.H. Butcher P.H. Butcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713515.0577

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Cc tor KD Lee / LD Walker Date Sampled 12/3/91 Time 0255 hours

Company Contact ~~B H Fand~~ PH Butcher Telephone (509)

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~BCG~~ B01DY9	1, 1L, P	W	ICP/AA Metals (HNO3) Unfiltered
~~BCG~~	3, 40ml aG	W	CLP VOA
	1, 1L, aG	W	CLP. Pest/ PCB
	1, 500ml P	W	Anions (F, NO2, NO3) (ZnAC+NaOH)
	1, 1250ml P	W	Ammonia (H2SO4)
	1, 125ml P	W	pH
	2, 4L P	W	Gross Alpha/Beta, Sr-90, Pu-239, Pu-238, Co-60, Cs-137 (HNO3)
B01DZ0	1, 1L P	W	ICP/AA Metals (HNO3) Filtered

Field Information** BOL # 2474325282-5 DPC # W92-0-0035-51

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

A 5000 405 105 00

9713515.0578

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/3/91

Ice Chest No. Sneezy-1

Field Logbook No. EFL-1000

Bill of Lading/Airbill No. 2474252882-5

Offsite Property No. W92-0-0035-51

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

BO1D21

1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
LW 12-5-91 1 ~~3~~, 1L, aG, WATER, CLP-PEST/PCB's
1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
1, 250ml, P, WATER, AMMONIA (H2SO4)
1, 125ml, P, WATER, pH
2, 4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238,
LW 12-5-91 Co-60, Cs-137 (HNO3)

BO1D22

1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: K.D. Lee	Received by: PH Butcher PH Butcher	Date/Time: 12/4/91 0800 12/3/91
Relinquished by: PH Butcher PH Butcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 9713515.0579

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Cc tor KD Lee / LD Walker Date Sampled 12/3/91 Time 1405 hours

Company Contact ~~R H Ford~~ PH Eitcher Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~BGO~~ B01DZ1	1, 1L, P	W	ICP/AA Metals (HNO3) Unfiltered
~~BGO~~	3, 40ml aG	W	CLP VOA
	1, 1L, aG	W	CLP. Pest/ PCB
	1, 500ml P	W	Anions (F, NO2, NO3) (ZnAC+NaOH)
	1, 1250ml P	W	Ammonia (H2SO4)
	1 125ml P	W	pH
	2, 4L P	W	Gross [redacted], Sr-90, [redacted]-235,
			[redacted]-238, Co-60, Cs-137 (HNO3)
B01DZ2	1, 1L P	W	ICP/AA Metals (HNO3) Filtered

Field Information** BOL # 2474252882-5 DPC # 6192-0-0035-51

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

GAB	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Aliquot (g or l)	0 30000		0 30000		0 30000		0 30000		0 30000		0 30000		0 30000		0 30000		0 30000	
6	Sample Weight (g or l)	0 16570		0 09560		0 15190		0 11060		0 16150		0 07410		0 10310		0 15980		0 10220	
7	Counted Weight (g or l)	0 16570		0 09560		0 15190		0 11060		0 16150		0 07410		0 10310		0 15980		0 10220	
8	[GROSS BETA]																		
9	Gross Counts	244 00000		282 00000		275 00000		982 00000		1054 00000		1097 00000		2033 00000		979 00000		1064 00000	
10	Time (min)	100 00000		100 00000		100 00000		103 00000		103 00000		200 00000		200 00000		200 00000		200 00000	
11	Gross CPM	2.44000		2.82000		2.75000		9.53398		10.23301		5.48500		10.16500		4.89500		5.32000	
12	BKG CPM	2 22900		1 77100		1 14800		1 11700		1 10800		1 89000		1 36900		1 80300		2 63000	
13	Observed CPM	0.21100		1.04900		1.60200		8.41698		9.12501		3.59500		8.79600		3.09200		2.69000	
14	Alpha to Beta Xtalk	0 36400		0 29800		0 35200		0 31300		0 36000		0 27900		0 30500		0 35900		0 30400	
15	Observed Alpha	-0 00100		0 00200		-0 01500		1 70800		0 16800		0 72000		1 29400		0 66400		0 40100	
16	Beta to Alpha Xtalk	0 00600		0 00600		0 00600		0 00600		0 00600		0 00600		0 00600		0 00600		0 00600	
17	True CPM	0.21183		6.29600		1.61068		0.80600		9.08415		3.39981		8.41873		2.85978		2.57279	
18	Efficiency (CPM/DPM)	0 40000		0 40000		0 40200		0 40800		0 40000		0 41700		0 40000		0 40000		0 41000	
19	DPM of Aliquot	0.52957		15.74000		4.00667		1.97549		22.71038		8.15302		20.57681		7.14946		6.27509	
20	Reported Results (pCi/g or pCi/l)	0 79400		3 83000		6 02000		29 10000		34.10000		12 20000		30.90000		10 70000		9 43000	
21	Calculated Results (pCi/g or pCi/l)	0.79515	OK	23.63363	*	6.01602	OK	2.96620	*	34.09967	OK	12.24178	OK	30.89911	OK	10.73492	OK	9.42206	OK
22	Reported MDA	2 61000		2 26000		1 87000		1 79000		1.81000		1 63000		1.41000		1.66000		1 96000	
23	Calculated MDA	2 61160	OK	2.32788	OK	1.86490	OK	1.78591	OK	1.81427	OK	1.63114	OK	1.41539	OK	1.66087	OK	1.95700	OK
24	Results > MDA?	NO		YES		YES		YES		YES		YES		YES		YES		YES	
25	[GROSS ALPHA]																		
26	Gross Counts	8 00000		7 00000		11 00000		188 00000		26 00000		162 00000		276 00000		144 00000		90 00000	
27	Time (min)	100 00000		100 00000		100 00000		103 00000		103 00000		200 00000		200 00000		200 00000		200 00000	
28	Gross CPM	0 08000		0 07000		0 11000		1.82524		0.25243		0.81000		1.38000		0.72000		0.45000	
29	BKG CPM	0 08100		0 06800		0 12500		0 11700		0 08500		0 09000		0 08600		0 05600		0 04900	
30	Observed CPM	-0.00100		0.00200		-0.01500		1.70824		0.16743		0.72000		1.29400		0.66400		0.40100	
31	Beta to Alpha Xtalk	0 00600		0 00600		0 00600		0 00600		0 00600		0 00600		0 00600		0 00600		0 00600	
32	True CPM	-0.00227		-0.00430		-0.02486		1.66086		0.11292		0.69960		1.26350		0.64584		0.38556	
33	Efficiency (CPM/DPM)	0 06600		0 09900		0 07000		0 09000		0 06800		0 11900		0 09300		0 06800		0 09400	
34	DPM of Aliquot	-0.03441		-0.04345		-0.35234		18.45400		1.66080		5.87900		13.37096		9.61237		4.10174	
35	Reported Results (pCi/g or pCi/l)	0 03916		0 07097		0 52000		27 80000		2 58000		8 83000		20 00000		14 30000		6 16000	
36	Calculated Results (pCi/g or pCi/l)	0.05100	*	0.00674	OK	0.02908	OK	27.70871	OK	2.49340	OK	8.82733	OK	20.07602	OK	14.20204	OK	6.14470	OK
37	Reported MDA	3 00000		1 84000		3 55000		2 63000		2 97000		1 25000		1 56000		1 73000		1 17000	
38	Calculated MDA	3.01724	OK	1.84302	OK	3.53402	OK	2.62025	OK	2.95593	OK	1.24730	OK	1.56014	OK	1.72180	OK	1.16511	OK
39	Results > MDA?	NO		NO		NO		YES		NO		YES		YES		YES		YES	

H3	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Sample Count 1	166.00000		206.00000		189.00000		1516.00000		205.00000		not requested		not requested		not requested		not requested	
6	Sample Count 2	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
7	Sample Count 3	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
8	Sample Count Time	50.00000		50.00000		50.00000		50.00000		50.00000		0.00000		0.00000		0.00000		0.00000	
9	WsubS1	15.06272		12.13974		13.23073		1.85592		12.19880		ERR		ERR		ERR		ERR	
10	WsubS2	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
11	WsubS3	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
12	Blank Count 1	201.00000		201.00000		201.00000		201.00000		201.00000		0.00000		0.00000		0.00000		0.00000	
13	Blank Count 2	195.00000		195.00000		195.00000		195.00000		195.00000		0.00000		0.00000		0.00000		0.00000	
14	Blank Count 3	194.00000		194.00000		194.00000		194.00000		194.00000		0.00000		0.00000		0.00000		0.00000	
15	Blank Count time	50.00000		50.00000		50.00000		50.00000		50.00000		0.00000		0.00000		0.00000		0.00000	
16	WsubB1	12.44145		12.44145		12.44145		12.44145		12.44145		0.00000		0.00000		0.00000		0.00000	
17	WsubB2	12.82394		12.82394		12.82394		12.82394		12.82394		0.00000		0.00000		0.00000		0.00000	
18	WsubB3	12.88999		12.88999		12.88999		12.88999		12.88999		0.00000		0.00000		0.00000		0.00000	
19	Blank CPM Average	3.93237		3.93237		3.93237		3.93237		3.93237		ERR		ERR		ERR		ERR	
20	Sample CPM average	5.32000		4.12000		3.78000		30.32000		4.10000		ERR		ERR		ERR		ERR	
21	Net CPM	-0.61237		0.18763		-0.15237		26.38763		0.16763		ERR		ERR		ERR		ERR	
22	Decay Correction	0.97547		0.97546		0.97546		0.97560		0.97560		0.00000		0.00000		0.00000		0.00000	
23	Efficiency	0.24100		0.24400		0.25200		0.24200		0.25000		0.00000		0.00000		0.00000		0.00000	
24	DPM of Aliquot	-2.60486		0.78831		-0.61986		111.76690		0.68728		ERR		ERR		ERR		ERR	
25	Aliquot	0.01000		0.01000		0.01000		0.01000		0.01000		0.00000		0.00000		0.00000		0.00000	
26	Reported Results (pCi/l)	-117.57000		35.51300		-27.87000		5034.80000		30.97600		0.00000		0.00000		0.00000		0.00000	
27	Calculated Results (pCi/l)	-117.33607	OK	35.60963	OK	-27.92176	OK	5034.54489	OK	30.96859	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
28	Reported MDA	144.55000		142.50000		137.71000		143.65000		139.13000		0.00000		0.00000		0.00000		0.00000	
29	Calculated MDA (method 1)	141.00616		139.27248		134.85113		140.42349		136.92994		ERR		ERR		ERR		ERR	
30	Calculated MDA (method 2)	141.02546		139.29154		134.86959		140.44271		135.94855		ERR		ERR		ERR		ERR	

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H3	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Sample Count 1	166 00000		206 00000		189 00000		1516 00000		205 00000		not requested		not requested		not requested		not requested	
6	Sample Count 2	0 00000		0 00000		0 00000		0 00000		0 00000		0 00000		0 00000		0 00000		0 00000	
7	Sample Count 3	0 00000		0 00000		0 00000		0 00000		0 00000		0 00000		0 00000		0 00000		0 00000	
8	Sample Count Time	50 00000		50 00000		50 00000		50 00000		50 00000		0 00000		0 00000		0 00000		0 00000	
9	WsubS1	15.06272		12 13974		13.23073		1 65592		12.19890		ERR		ERR		ERR		ERR	
10	WsubS2	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
11	WsubS3	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
12	Blank Count 1	201 00000		201 00000		201 00000		201 00000		201 00000		0 00000		0 00000		0 00000		0 00000	
13	Blank Count 2	195 00000		195 00000		195 00000		195 00000		195 00000		0 00000		0 00000		0 00000		0 00000	
14	Blank Count 3	194 00000		194 00000		194 00000		194 00000		194 00000		0 00000		0 00000		0 00000		0 00000	
15	Blank Count time	50 00000		50 00000		50 00000		50 00000		50 00000		0 00000		0.00000		0.00000		0 00000	
16	WsubB1	12 44145		12.44145		12.44145		12.44145		12 44145		0.00000		0.00000		0.00000		0.00000	
17	WsubB2	12 82394		12.82394		12.82394		12.82394		12.82394		0.00000		0.00000		0.00000		0.00000	
18	WsubB3	12.88999		12.88999		12.88999		12.88999		12.88999		0.00000		0.00000		0.00000		0.00000	
19	Blank CPM Average	3.93237		3.93237		3.93237		3.93237		3.93237		ERR		ERR		ERR		ERR	
20	Sample CPM average	3 32000		4.12000		3.78000		30.32000		4.10000		ERR		ERR		ERR		ERR	
21	Net CPM	-0.61237		0.18763		-0.15237		26.38763		0.16763		ERR		ERR		ERR		ERR	
22	Decay Correction	0 97547		0 97546		0 97546		0 97560		0 97560		0 00000		0 00000		0 00000		0 00000	
23	Efficiency	0 24100		0 24400		0 25200		0 24200		0 25000		0 00000		0 00000		0 00000		0 00000	
24	DPM of Aliquot	-2.60486		0.78631		-0.61986		111.76690		0.66726		ERR		ERR		ERR		ERR	
25	Aliquot	0 01000		0 01000		0 01000		0 01000		0 01000		0 00000		0 00000		0 00000		0 00000	
26	Reported Results (pCi/l)	-117 57000		35 51300		-27 87000		5034 80000		30 97600		0 00000		0 00000		0.00000		0.00000	
27	Calculated Results (pCi/l)	-117.33607	OK	35.50953	OK	-27.92176	OK	5034.54489	OK	30.96859	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
28	Reported MDA	144 55000		142 50000		137 71000		143 65000		139 13000		0 00000		0 00000		0 00000		0 00000	
29	Calculated MDA (method 1)	141.00616		139.27248		134.85113		140.42349		136.92994		ERR		ERR		ERR		ERR	
30	Calculated MDA (method 2)	141.02546		139.20154		134.88959		140.44271		136.94855		ERR		ERR		ERR		ERR	

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SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	ET	CTS	TIME	CPM	SF	CPM	X	Wx	Wb	WY	WX	WXY	WX^2
5	9573-1	not requested	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
6	BQ1DH7	0 00000	0 00000	0 00000	0.00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7	Water	0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8		0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
9		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10		0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11		0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12		DELTA=	0.00000					SUMS=	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
13														
14						PRODUCT		NBS CORR		REPORTED	CALCULATED		Calculated	Reported
15		Y @ MILK	REPORTED	CALCULATED		0.00000		0.00000		RESULTS	RESULTS		MDA	Results > MDA ?
16		1 COMP=	0 00000	ERR	ERR					0.00000	ERR	ERR	ERR	ERR
17		2 COMP=	0 00000	ERR	ERR	P-FACTOR		C-ZERO						
18						0.00000		ERR						
19														
20	9573-2	1 28700	127 00000	223 70000	0.53940	1.02440	0.02902	0.70713	271.06119	926.95588	7.88504	191.67434	5.56158	135.53788
21	BQ1DJ0	2 06700	61 00000	107 50000	0 54130	0 96730	0.02529	0.58100	155.43453	923.70220	3.93048	90.30873	2.28359	52.46778
22	Water	0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
25		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
26		0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27		DELTA=	670.27798					SUMS=	426.49572	1850.66808	11.70552	281.98107	7.84516	188.00584
28														
29						PRODUCT		NBS CORR		REPORTED	CALCULATED		Calculated	Reported
30		Y @ MILK	REPORTED	CALCULATED		0 78179		0 96800		RESULTS	RESULTS		MDA	Results > MDA ?
31		1 COMP=	NA	0.04173	*					0.03157	0.02976	OK	0.24069	No
32		2 COMP=	0 03100	0.02956	OK	P-FACTOR		C-ZERO						
33						1.75900		0.03881						
34														
35	9573-3	1 28700	98 00000	223 70000	0.54620	1 00500	-0.10865	0 70713	323 21152	915 41560	0.32321	228 55119	0.22855	181 61443
36	BQ1DJ3	2 06700	48 00000	107 50000	0.53940	1.02650	-0 09536	0.58100	189 49244	926 95588	0.18849	110.09421	0.11009	63 96421
37	Water	0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
38		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
40		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
41		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
42		DELTA=	674.35861					SUMS=	512.70396	1842.37148	0.51270	338.64540	0.33865	225.57864
43														
44						PRODUCT		NBS CORR		REPORTED	CALCULATED		Calculated	Reported
45		Y @ MILK	REPORTED	CALCULATED		0 78330		0 96800		RESULTS	RESULTS		MDA	Results > MDA ?
46		1 COMP=	NA	0.00150	*					-0 00000	0.00000	*	0.23350	No

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SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	#T	CTS	TIME	CPM	SF	CPM	X	Wx	Wb	WY	WX	WXY	WX^2
47		2 COMP=	0 00000	0.00000	*	P-FACTOR		C-ZERO						
48						1.75900		-0.00000						
49														
50	9573-4	1 28700	172 00000	223 70000	0 56750	0 97890	0.19714	0.70713	212.53302	881.05727	41.86826	150.28757	29.62734	106.27221
51	BO1DL7	2 06700	71 00000	107 50000	0 54620	1.00440	0.11477	0.58100	136.34362	915.41560	15.64787	79.21500	9.09134	46.02354
52	Water	3 11000	78 00000	100 60000	0 54560	1.00330	0.23061	0.44321	111.93573	916.42229	25.80187	49.61079	11.43569	21.98789
53		4 13600	61 00000	100 60000	0.71180	1.02060	-0.10761	0.33947	132.73549	702.44451	0.13274	45.05955	0.04506	15.29629
54		5 02700	64 00000	100 20000	0 54130	0.96730	0.09424	0.26930	132.47017	923.70220	12.48357	36.67443	3.36185	9.60718
55		0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
56		0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
57		DELTA=	10123.34374					SUMS=	728.01804	4339.04166	95.96430	359.84732	53.56117	169.18712
58														
59						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
60		Y @ MILK	REPORTED	CALCULATED		0 80823		0 96800		RESULTS	RESULTS		MDA	Results > MDA ?
61		1 COMP=	0 27100	0.26890	OK					0 25690	0.25518	OK	0.22766	Yes
62		2 COMP=	NA	0.28769	*	P-FACTOR		C-ZERO						
63						1 75900		0.33270						
64														
65	9573-5	1 28700	102 00000	223 70000	0 51630	1 04830	-0.06325	0.70713	320.75138	968.42921	0.32075	226.61156	0.22681	160.38429
66	BO1DN8	2 06700	59 00000	107 50000	0 56750	0 97770	-0.01825	0.58100	158.52289	881.05727	0.15852	92.10104	0.09210	53.51027
67	water	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
68		0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
69		0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70		0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
71		0 00000	0.00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
72		DELTA=	808.91076					SUMS=	479.27427	1849.48648	0.47927	318.91260	0.31891	213.89456
73														
74						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
75		Y @ MILK	REPORTED	CALCULATED		0 77943		0 96800		RESULTS	RESULTS		MDA	Results > MDA ?
76		1 COMP=	NA	0.00149	*					0 00000	0.00000	*	0.23902	No
77		2 COMP=	0 00000	0.00000	*	P-FACTOR		C-ZERO						
78						1 75900		0.00000						
79														
80	9573-6	1 01900	87 00000	142 30000	0 51500	1 05220	0.10142	0.76146	184.62410	970.67379	18.74406	140.73589	14.27292	107.18606
81	BO1DY6	1 95600	77 00000	102 50000	0 53980	0 99760	0.21091	0.59816	117.15713	926.26899	24.70986	70.07890	14.78049	41.91861
82	water	3 01700	100 00000	100 30000	0 72340	1 01510	0.27774	0.45406	86.12727	691.18054	23.92103	39.10680	10.86154	17.75677
83		4 08600	47 00000	99 12000	0 51500	1 05170	-0.04294	0.34394	170.52003	970.67379	0.17052	58.64801	0.05865	20.17117
84		4 97100	66 00000	100 30000	0 52140	1 05140	0.14386	0.27325	129.85660	958.95686	18.65371	35.48310	5.09709	9.69570
85		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
86		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
87		DELTA=	17057.73096					SUMS=	688.48513	4518.15375	86.18917	344.05370	45.07070	196.70821
88														

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SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	ET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
89						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
90		Y @ MILK	REPORTED	CALCULATED		0 24514		0 96800		RESULTS	RESULTS		MDA	Results > MDA ?
91		1 COMP=	NA	0.22912	*					0.25283	0.25190	OK	0.92945	No
92		2 COMP=	0 08100	0.08051	OK	P-FACTOR		C-ZERO						
93						1 75900		0.32843						
94														
95	9573-7	1 01900	84 00000	142 30000	0 57930	1 07880	0.01187	0.76146	185.69080	863.11065	2.20399	141.39885	1.67826	107.66860
96	BO1DY7	1 95600	77 00000	102 50000	0 56700	0 97890	0.16033	0.56816	116.41518	881.83422	20.99344	69.63509	12.55747	41.66304
97	water	0 00000	0 00000	0 00000	0.00000	0 96430	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
98		0 00000	0 00000	0 00000	0 00000	0 98290	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
99		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
100		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
101		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
102		DELTA=	576.48063					SUMS=	302.10598	1744.94487	23.19743	211.03194	14.23573	149.32164
103														
104						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
105		Y @ MILK	REPORTED	CALCULATED		0.65777		0 96800		RESULTS	RESULTS		MDA	Results > MDA ?
106		1 COMP=	NA	0.09534	*					-1.21410	-1.20290	OK	0.37200	No
107		2 COMP=	-1 04100	-1.03160	OK	P-FACTOR		C-ZERO						
108						1 75900		-1.66836						
109														
110	9573-8	1 01900	75 00000	142 30000	0 63670	1 03840	-0.11385	0.76146	198.42310	785.29920	0.19842	151.09204	0.15109	115.08114
111	BO1DY9	1 95600	71 00000	102 50000	0 51500	1 05090	0.16673	0.56816	126.64898	970.87379	23.64878	76.75656	14.14576	45.31467
112	water	0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
113		0 (XXXX)	0 (XXXX)	0 (XXXX)	0 (XXXX)	0 (XXXX)	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
114		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
115		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
116		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
117		DELTA=	870.16023					SUMS=	325.07208	1756.17299	23.84721	226.84860	14.29689	160.38580
118														
119						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
120		Y @ MILK	REPORTED	CALCULATED		0 38507		0 96800		RESULTS	RESULTS		MDA	Results > MDA ?
121		1 COMP=	NA	0.08915	*					-2.29080	-2.28530	OK	0.85358	No
122		2 COMP=	-1 15000	-1.13732	OK	P-FACTOR		C-ZERO						
123						1 75900		-2.95351						
124														
125	9573-9	1 01900	98 00000	142 30000	0 54440	1.00900	0.14558	0.76146	165.69485	918.44232	24.12259	126.17065	18.36648	96.07440
126	BO1DZ1	1 95600	58 00000	102 50000	0 57930	1.07790	-0.01449	0.56816	148.12255	863.11065	0.14812	86.60123	0.08860	52.99785
127	water	0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
128		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
129		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
130		0 00000	0 00000	0 00000	0 00000	0 00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

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SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	BT	CTS	TIME	CPM	SF	CPM	X	Wx	Wb	WY	WX	WXY	WX^2
131		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
132		DELTA=	654.50793					SUMS=	313.81740	1781.55297	24.27072	214.77188	18.45709	149.07225
133														
134						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
135		Y @ MILK	REPORTED	CALCULATED		0.34318		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
136		1 COMP=	0.12500	0.12381	OK					0.27849	0.27672	OK	0.68847	No
137		2 COMP=	NA	0.88538	*	P-FACTOR		C-ZERO						
138						1.75900		0.36079						
139														

Tc99	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN6		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Sample Weight	not requested		0.20000		0.20000		0.20000		0.20000		not requested		not requested		not requested		not requested	
6	Average Net CPM	0.00000		0.59000		0.36000		0.92000		4.43000		0.00000		0.00000		0.00000		0.00000	
7	Detector P.Factor	0.00000		2.34000		2.34000		2.34000		2.34000		0.00000		0.00000		0.00000		0.00000	
8	Yield	0.00000		0.31150		0.67210		0.62980		0.37200		0.00000		0.00000		0.00000		0.00000	
9	Reported Results	0.00000		9.95760		2.83090		7.71180		62.73400		0.00000		0.00000		0.00000		0.00000	
10	Calculated Results	ERR	ERR	9.98221	OK	2.82294	OK	7.69871	OK	62.76155	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
11	Bkg 1	0.00000		0.77000		0.71000		0.43000		0.71000		0.00000		0.00000		0.00000		0.00000	
12	Time 1	0.00000		29.40000		29.40000		29.40000		29.40000		0.00000		0.00000		0.00000		0.00000	
13	SF 1	0.00000		1.01900		1.00500		0.97500		1.02700		0.00000		0.00000		0.00000		0.00000	
14	MDA 1	ERR		13.00189		5.70698		4.59815		10.53663		ERR		ERR		ERR		ERR	
15	Results > MDA ?	ERR		NO		NO		YES		YES		ERR		ERR		ERR		ERR	

9713515.0507

I129	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Time	not requested		251 20000		193 05000		906 63000		251 85000		not requested		not requested		not requested		not requested	
6	Bkg CPM	0 00000		1 15000		1 23300		1 20800		1 55300		0 00000		0 00000		0 00000		0 00000	
7	Blank CPM	0 00000		-0 58100		-0 58100		-0 58100		-0 58100		0 00000		0 00000		0 00000		0 00000	
8	Net	0 00000		0 24700		0 12500		0 15900		-0 16100		0 00000		0 00000		0 00000		0 00000	
9	Yield	0 00000		0 72150		0 71510		0 70910		0 65460		0 00000		0 00000		0 00000		0 00000	
10	Aliquot	0 00000		0 50000		0 50000		0 50000		0 50000		0 00000		0 00000		0 00000		0 00000	
11	P-Factor	0 00000		4 64000		4 64000		4 64000		4 64000		0 00000		0 00000		0 00000		0 00000	
12	Reported Results	0 00000		1 42900		0 73200		0 93640		-1 03100		0 00000		0 00000		0 00000		0 00000	
13	Calculated Results	ERR	ERR	1 43105	OK	0.73070	OK	0.93731	OK	-1.02812	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
14	Calculated MDA	ERR		20 36576		21.99571		21.75240		29.33851		ERR		ERR		ERR		ERR	
15	Results > MDA ?	ERR		NO		NO		NO		NO		ERR		ERR		ERR		ERR	

IsoU	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	U232 Tracer Added (DPM)	10.25000		10.25000		10.25000		10.25000		10.25000		10.25000		10.25000		10.25000		10.25000	
6	Sample Size (g or l)	0.80000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
7	Tracer BKG (CPM)	0.00708		0.00406		0.01221		0.00608		0.00406		0.00955		0.00407		0.01221		0.01430	
8	Tracer Counts	2816.00000		1808.00000		1511.00000		1733.00000		1374.00000		1003.00000		876.00000		861.00000		930.00000	
9	Counting Time (min)	1194.87000		1011.95000		1032.45000		791.43000		876.93000		747.47000		747.47000		747.47000		746.22000	
10	Detector Efficiency	0.31950		0.27560		0.28530		0.33120		0.27530		0.25500		0.26850		0.28950		0.24880	
11	Reported Yield	0.71780		0.63100		0.49610		0.64300		0.55360		0.50980		0.42440		0.38410		0.48290	
12	Calculated Yield	0.71748	OK	0.63103	OK	0.49629	OK	0.64323	OK	0.55382	OK	0.50973	OK	0.42436	OK	0.38407	OK	0.48309	OK
13	[U234]																		
14	BKG (CPM)	0.00379		0.00162		0.00570		0.01042		0.00162		0.01215		0.00163		0.00488		0.00780	
15	Gross Counts	413.00000		14.00000		28.00000		7770.00000		688.00000		1418.00000		2142.00000		1271.00000		1180.00000	
16	U235 Counts	0.00000		0.00000		0.00000		50.00000		3.00000		11.00000		13.00000		8.00000		6.00000	
17	Branch Ratio	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
18	Tracer Counts	3.00000		3.00000		3.00000		3.00000		2.00000		2.00000		2.00000		2.00000		2.00000	
19	Reported Results (pCi/g or pCi/l)	0.63210		0.02304		0.05856		20.60000		2.29800		6.47100		11.24000		6.82300		5.85800	
20	Calculated Results (pCi/g or pCi/l)	0.63352	OK	0.02398	OK	0.05890	OK	20.59511	OK	2.29629	OK	6.47190	OK	11.24336	OK	6.82564	OK	5.85687	OK
21	MDA Reported	0.02140		0.01690		0.03520		0.09480		0.03140		0.09660		0.09220		0.07990		0.08110	
22	MDA Calculated	0.02627	*	0.02569	*	0.04282	*	0.09747	OK	0.03980	*	0.10151	OK	0.09925	OK	0.08619	OK	0.08704	OK
23	Results > MDA?	YES		YES		YES		YES		YES		YES		YES		YES		YES	
24	[U235]																		
25	BKG (CPM)	0.00126		0.00162		0.00163		0.00174		0.00162		0.00130		0.00000		0.00081		0.00000	
26	Gross Counts	25.00000		1.00000		1.00000		455.00000		31.00000		98.00000		120.00000		54.00000		59.00000	
27	U235 Counts	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
28	Branch Ratio	0.82600		0.82600		0.82600		0.82600		0.82600		0.82600		0.82600		0.82600		0.82600	
29	Tracer Counts	2.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
30	Table Counts	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
31	Reported Results (pCi/g or pCi/l)	0.05223		-0.00620		-0.00746		1.46500		0.11830		0.53880		0.76190		0.34120		0.35280	
32	Calculated Results (pCi/g or pCi/l)	0.05349	OK	-0.00508	*	-0.00628	*	1.46398	OK	0.11657	OK	0.53900	OK	0.76198	OK	0.34380	OK	0.35265	OK
33	MDA Reported	0.01640		0.02040		0.02460		0.01510		0.01900		0.02620		0.02980		0.03060		0.02830	
34	MDA Calculated	0.02170	*	0.02348	*	0.02848	*	0.02325	*	0.02958	*	0.03672	*	0.02984	OK	0.03874	*	0.02835	OK
35	Results > MDA?	YES		NO		NO		YES		YES		YES		YES		YES		YES	
36	[U238]																		
37	BKG (CPM)	0.00076		0.00081		0.00163		0.00217		0.00081		0.00174		0.00000		0.00081		0.00043	
38	Gross Counts	383.00000		5.00000		22.00000		7497.00000		828.00000		1276.00000		2174.00000		1246.00000		1172.00000	
39	U235 Counts	2.00000		0.00000		0.00000		45.00000		3.00000		10.00000		12.00000		5.00000		6.00000	
40	Branch Ratio	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
41	Tracer Counts	2.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
42	Reported Results (pCi/g or pCi/l)	0.77660		0.00768		0.05856		19.90000		2.10000		5.85900		11.43000		6.71400		5.65300	
43	Calculated Results (pCi/g or pCi/l)	0.77723	OK	0.00814	OK	0.05862	OK	19.90189	OK	2.09991	OK	5.85889	OK	11.42964	OK	6.71747	OK	5.64933	OK
44	MDA Reported	0.01660		0.01190		0.02030		0.08540		0.03140		0.07160		0.08540		0.06190		0.05730	
45	MDA Calculated	0.02121	*	0.01609	*	0.02553	*	0.06603	OK	0.03409	OK	0.07576	OK	0.08886	OK	0.06491	OK	0.06335	OK
46	Results > MDA?	YES		NO		YES		YES		YES		YES		YES		YES		YES	

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PU241	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY6		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	BKG time	?		?		?		?		?		?		?		?		?	
6	Gross Beta CPM	not requested		14 02000		14 51000		14 35000		15 03000		not requested		not requested		not requested		not requested	
7	Gross Alpha CPM	0 00000		6 65000		6 48000		8 00000		7 81000		0 00000		0 00000		0 00000		0 00000	
8	Bkg Beta CPM	0 00000		14 57000		14 57000		14 57000		14 57000		0 00000		0 00000		0 00000		0 00000	
9	BKG Alpha CPM	0 00000		3 66000		3 66000		3 66000		3 66000		0 00000		0 00000		0 00000		0 00000	
10	PU242 tracer added	0 00000		5 96000		5 96000		5 96000		5 96000		0 00000		0 00000		0 00000		0 00000	
11	Pu239 DPM of Aliquot	0 00000		0 00000		0 00490		0 00533		0 00775		0 00000		0 00000		0 00000		0 00000	
12	Pu238 DPM of Aliquot	0 00000		0 00404		0 00492		-0 00535		-0 00389		0 00000		0 00000		0 00000		0 00000	
13	Beta Efficiency	0 00000		0 34760		0 34760		0 34760		0 34760		0 00000		0 00000		0 00000		0 00000	
14	Alpha Efficiency	0 00000		0 96100		0 96100		0 96100		0 96100		0 00000		0 00000		0 00000		0 00000	
15	delta T = Time	0 00000		196 00000		196 00000		195 00000		185 00000		0 00000		0 00000		0 00000		0 00000	
16	wt (vol)	0 00000		1 00000		1 00000		1 00000		1 00000		0 00000		0 00000		0 00000		0 00000	
17	Reported Chemical Yield	0 00000		0 52170		Data missing		Data missing		Data missing		0 00000		0 00000		0 00000		0 00000	
18	Calculated Chemical Yield	ERR	ERR	0 52188	OK	0 49155	*	0 75774	*	0.72410	*	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
19	Reported Results	0 00000		-1 40000		0 16300		0 38700		0 82300		0 00000		0 00000		0 00000		0 00000	
20	Calculated Results	ERR	ERR	-1.40125	OK	-0.18224	*	-0.38584	*	0.84315	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
21	delta T > 180 ?	No		Yes		Yes		Yes		Yes		No		No		No		No	
22	Calculatot MDA (LSC)	ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR	
23	Reported Results > MDA ?	ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR	

IsoPu	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Pu242 Tracer Added (DPM)	NR		5.96000		5.96000		5.96000		5.96000		NR		NR		NR		NR	
6	Sample Size (g or l)	0.00000		1.00000		1.00000		1.00000		1.00000		0.00000		0.00000		0.00000		0.00000	
7	Tracer BKG (CPM)	0.00000		0.00260		0.00130		0.00120		0.00173		0.00000		0.00000		0.00000		0.00000	
8	Tracer Counts	0.00000		1483.00000		1218.00000		2238.00000		1539.00000		0.00000		0.00000		0.00000		0.00000	
9	Counting Time (min)	0.00000		792.42000		792.42000		1097.23000		792.42000		0.00000		0.00000		0.00000		0.00000	
10	Detector Efficiency	0.00000		0.39030		0.39760		0.39980		0.38430		0.00000		0.00000		0.00000		0.00000	
11	Reported Yield	0.00000		0.80310		0.64780		0.85540		0.84720		0.00000		0.00000		0.00000		0.00000	
12	Calculated Yield	ERR	ERR	0.80341	OK	0.64806	OK	0.85550	OK	0.84719	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
13	[Pu236]																		
14	BKG (CPM)	0.00000		0.00087		0.00173		0.00409		0.00000		0.00000		0.00000		0.00000		0.00000	
15	Gross Counts	0.00000		2.00000		0.00000		4.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
16	Branch Ratio	0.00000		1.00000		1.00000		1.00000		1.00000		0.00000		0.00000		0.00000		0.00000	
17	Tracer Counts	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
18	Reported Results (pCi/g or pCi/l)	0.00000		0.00202		-0.00246		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
19	Calculated Results (pCi/g or pCi/l)	ERR	ERR	0.00238	*	0.00302	*	-0.00059	*	0.00000	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
20	MDA Reported	0.00000		0.00942		0.01150		0.01260		0.00906		0.00000		0.00000		0.00000		0.00000	
21	MDA Calculated	ERR	ERR	0.00702	*	0.01204	OK	0.01185	OK	0.00000	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
22	Results > MDA?	YES		NO		NO		NO		NO		YES		YES		YES		YES	
23	[Pu238]																		
24	BKG (CPM)	0.00000		0.00087		0.00130		0.00722		0.00087		0.00000		0.00000		0.00000		0.00000	
25	Gross Counts	0.00000		2.00000		2.00000		6.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
26	Branch Ratio	0.00000		1.00000		1.00000		1.00000		1.00000		0.00000		0.00000		0.00000		0.00000	
27	Tracer Counts	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
28	Reported Results (pCi/g or pCi/l)	0.00000		0.00182		0.00222		-0.00241		-0.00175		0.00000		0.00000		0.00000		0.00000	
29	Calculated Results (pCi/g or pCi/l)	ERR	ERR	0.00238	*	0.00214	OK	-0.00231	OK	-0.00120	*	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
30	MDA Reported	0.00000		0.00848		0.01030		0.01590		0.00817		0.00000		0.00000		0.00000		0.00000	
31	MDA Calculated	ERR	ERR	0.00702	*	0.01044	OK	0.01674	OK	0.00676	*	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
32	Results > MDA?	YES		NO		NO		NO		NO		YES		YES		YES		YES	
33	[Pu239]																		
34	BKG (CPM)	0.00000		0.00173		0.00130		0.00166		0.00043		0.00000		0.00000		0.00000		0.00000	
35	Gross Counts	0.00000		1.00000		2.00000		4.00000		2.00000		0.00000		0.00000		0.00000		0.00000	
36	Branch Ratio	0.00000		1.00000		1.00000		1.00000		1.00000		0.00000		0.00000		0.00000		0.00000	
37	Tracer Counts	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
38	Reported Results (pCi/g or pCi/l)	0.00000		0.00000		0.00222		0.00240		0.00349		0.00000		0.00000		0.00000		0.00000	
39	Calculated Results (pCi/g or pCi/l)	ERR	ERR	-0.00067	*	0.00214	OK	0.00259	OK	0.00290	*	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
40	MDA Reported	0.00000		0.00845		0.01030		0.00791		0.00814		0.00000		0.00000		0.00000		0.00000	
41	MDA Calculated	ERR	ERR	0.00989	*	0.01044	OK	0.00759	OK	0.00475	*	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
42	Results > MDA?	YES		NO		NO		NO		NO		YES		YES		YES		YES	

9713515.0501

Gamma	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Detector	G-2 MB		G-3 MB		G-3 MB		G-2 MB		G-3 MB		G-5 MB		G-2 MB		G-3 MB		G-2 MB	
6	Aliquot (g or l)	5 00000		0 50000		0 50000		0 50000		0 50000		0 50000		0 50000		0 50000		0.50000	
7	Counting Time (min)	985 58000		402 87000		493 73000		1165.72000		1166 27000		1166 43000		444 70000		444 82000		891.13000	
8	[Cobalt 60; Co-60]																		
9	Background CTS	24 00000		0 00000		0 00000		44 00000		0 00000		0 00000		0 00000		24 00000		33 00000	
10	Background CPM	0 07220		0 02110		0 02110		0 07650		0 02110		0 01170		0 07560		0 02420		0 07560	
11	Net CPM	0 04200		0 06600		0 04700		0 03600		0 03500		0 03000		0 00000		0 06300		0 04700	
12	Branch Fraction	1 00000		1 00000		1 00000		1 00000		1 00000		1 00000		1 00000		1 00000		1 00000	
13	Efficiency	0 00343		0 00366		0 00366		0 00343		0 00366		0 00382		0 00343		0 00366		0 00343	
14	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*
15	Calculated Results (pCi/g or pCi/l)	1.10314		16.98420		11.56695		9.45552		8.61517		7.07514		17.33512		16.50731		12.34471	
16	Reported MDA	1 17200	OK	18 12000	OK	12 30000	OK	10 16000	OK	9 15000	OK	7 59900	OK	18 48000	OK	16 52000	OK	13 16000	OK
17	Calculated MDA	1.21144		8.30120		7.49867		12.11886		4.87892		3.48087		16.95865		15.20430		13.76032	
18	Detect/Non Detect	Non Detect	NO	Non Detect	YES	Non Detect	YES	Non Detect	NO	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	NO
19	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
20	[Cesium 137; Cs-137]																		
21	Background CTS	0 00000		0 00000		0 00000		0 00000		0 00000		0 00000		0 00000		0 00000		0.00000	
22	Background CPM	0 02700		0 03210		0.03210		0 02700		0 03210		0 00000		0 02700		0 03280		0.02700	
23	Net CPM	0 04300		0 10300		0 09000		0 04800		0 05400		0 04500		0 07300		0.09500		0.05100	
24	Branch Fraction	0 85100		0 85100		0 85100		0 85100		0 85100		0 85100		0 85100		0 85100		0 85100	
25	Efficiency	0 00673		0 00734		0.00734		0 00673		0 00734		0 00732		0.00673		0 00734		0 00673	
26	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*
27	Calculated Results (pCi/g or pCi/l)	0.67640		14.86556		12.98067		7.55046		7.78834		6.60802		11.48300		13.70172		8.02297	
28	Reported MDA	0 68840	OK	15 00000	OK	13 10000	OK	7 58100	OK	7 91100	OK	6 58300	OK	11 60000	OK	13 79000	OK	8.15100	OK
29	Calculated MDA	0.38367		5.99639		5.41932		3.52779		3.52806		0.00000		5.71172		5.77141		4.03487	
30	Detect/Non Detect	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES
31	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
32	[Thorium 228; Th-228]																		
33	Background CTS	423 00000		398 00000		444 00000		585 00000		1339 00000		726 00000		248 00000		461 00000		459 00000	
34	Background CPM	0 14690		0 18620		0 23440		0 14060		0 22370		0 27930		0 14620		0 18300		0 14620	
35	Net CPM	0 10100		0 20800		0 19500		0 09300		0 12100		0 11100		0 10800		0 20100		0 09400	
36	Branch Fraction	0 44800		0 44800		0 44800		0 44800		0 44800		0 44800		0 44800		0 44800		0.44800	
37	Efficiency	0 01731		0 02043		0 02043		0 01731		0 02043		0 01866		0 01731		0 02043		0.01731	
38	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*	12 91000	*	<	*	<	*	15 00000	*	<	*	13.01000	*
39	Calculated Results (pCi/g or pCi/l)	1.17334		20.47359		19.19399		10.80401		11.91012		11.98218		12.54659		19.78467		10.92018	
40	Reported MDA	1 41200	*	24 39000	*	22 89000	*	NA	*	14 20000	*	14 31000	*	NA	*	23 71000	*	NA	*
41	Calculated MDA	1.30884		24.76218		21.97943		12.70883		15.73125		13.96297		21.53790		24.01557		14.74717	
42	Detect/Non Detect	Non Detect	NO	Non Detect	NO	Non Detect	NO	Detect	NO	Non Detect	NO	Non Detect	NO	Detect	NO	Non Detect	NO	Detect	NO
43	Results > MDA?	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	NO	YES

TMA/Norcal N1-12-104-7003

First Round Groundwater Samples

Gross Alpha

	MDA	2xMDA	5xMDA
	1.760	3.520	8.800

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-38	-0.070	-0.400	-140.4	
9573-39	-0.500	-0.300	-50.000	
7003-18	6.850	3.300	69.951	

Gross Beta

	MDA	2xMDA	5xMDA
	1.840	3.680	9.200

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-38	3.830	4.420	14.303	
9573-39	6.020	4.170	36.310	
7003-18	12.100	18.100	39.735	

Tritium

	MDA	2xMDA	5xMDA
	126.690	253.380	633.450

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-56	355	-114	389	
9573-57	-279	199	-1195	

Strontium 90

	MDA	2xMDA	5xMDA
	0.298	0.596	1.490

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-14	0.032	0.041	25.173	
9573-15	0.000	-0.154	-200	
7003-15	0.190	0.272	35.498	

Tech 99

	MDA	2xMDA	5xMDA
	4.508	9.016	22.540

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-26	9.960	1.650	143	
9573-27	2.830	0.603	130	

I129

	MDA	2xMDA	5xMDA
	0.019	0.039	0.097

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-44	1.430	0.110	171.429	
9573-45	0.732	2.520	109.963	

Isotopic U

Uranium 233/234

	MDA	2xMDA	5xMDA
	0.034 ~~0.381~~	0.762	1.905

Customer I.D. #	Original S	Duplicate D	RPD	Q
7003-12	6.750	8.900	27.476	
9573-21	0.059	0.678	168.178	

Uranium 235

	MDA	2xMDA	5xMDA
	0.015	0.030	0.076

Customer I.D. #	Original S	Duplicate D	RPD	Q
7003-12	0.682	0.793	15.051	
9573-21	-0.075	0.057	-1476	

Uranium 238

	MDA	2xMDA	5xMDA
	0.027	0.053	0.133

Customer I.D. #	Original S	Duplicate D	RPD	Q
7003-12	6.010	8.550	34.890	
9573-21	0.059	0.685	168	

Original in N1-12-104-7003

Isotopic Pu

Pu238

MDA	2xMDA	5xMDA
0.005	0.010	0.024

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-14	0.002	-0.002	8689	Jor UJ
9573-15	0.002	-0.010	-300	
9573-60	-0.002	0.001	-600	

Pu239

MDA	2xMDA	5xMDA
0.005	0.010	0.024

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-14	0.000	0.004	200	
9573-15	0.002	-0.004	-600	Jor UJ
9573-60	0.002	0.002	4.691	

Pu241

MDA	2xMDA	5xMDA
*	0.000	0.000

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-14	1.400	-2.080	-1024	Jor UJ
9573-15	0.163	-13.940	-205	
9573-60	0.380	-1.450	-342	

* MDA not reported and cannot be calculated

Gamma Spec

Colbolt 60

MDA	2xMDA	5xMDA
10.790	21.580	53.950

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-50	17.870	16.080	10.545	ok
9573-51	12.300	16.540	29.404	
7003-21	16.790	19.460	14.731	

Cesium 137

MDA	2xMDA	5xMDA
9.175	18.350	45.875

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-50	15.000	15.510	3.343	
9573-51	13.100	9.731	29.513	ok
7003-21	22.890	34.590	40.710	

Thorium 228

MDA	2xMDA	5xMDA
12.630	25.260	63.150

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-50	24.320	21.390	12.820	ok
9573-51	22.890	34.590	40.710	
7003-21	18.140	23.870	27.279	

97135150594

9713515.0595

HARTCROWSER

Earth and Environmental Technologies

Hart Crowser, Inc.
1201 Jadwin Avenue, Suite 204
Richland, Washington 99352
FAX 509.946.4203
509.946.4344

J-2978-50

July 20, 1993

Ms. Jeanette Duncan
Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

Re: WHC Order No. MLW-SVV-037106
Task Order No. E-93-06
Return of Original Data for 300-FF-5 RI Samples

Dear Ms. Duncan:

Enclosed please find the 300-FF-5 Operable Unit Remedial Investigations (RI), Final Quality Assurance Reports (FQARs) listed on the attachment. Please contact me if you have any questions with regard to the materials being returned to you.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Task Manager

RECEIVED
JUL 22 1993
VALIDATION DOCUMENTATION
SDLA

cc: L. Hulstrom, Westinghouse Hanford
300-FF-5 Project File (HCRL-WHC/9306-L-93-147)
Attachment - Data Returned to Westinghouse Hanford, July 20, 1993

Data Returned to Westinghouse Hanford								
July 20, 1993								
			Work Completed		Data included with this transmittal:			
Sample Delivery Group Number	Case Numbers	Project	Verified	Validated	ODP	VCL	PQAR	FQAR
B012L8-TMA-118	N1-12--104-7003	300-FF-5	X	X				X
B01DW7-TMA-108	N2-01-112-7005	300-FF-5	X	X				X
B01DH7-TMA-066	N1-12-028-9573	300-FF-5	X	X				X
B01DK2-TMA-083	N2-01-021-9583	300-FF-5	X	X				X
B01DM6-TMA-085	N1-12-043-9576	300-FF-5	X	X				X
B01DM0-TMA-091	N1-01-057-7002	300-FF-5	X	X				X
B062B8-TMA-191	N2-04-067-7033	300-FF-5	X	X				X
B062B8-TMA-191	N2-05-006-7035	300-FF-5	X	X				X
Notes:								
ODP = Original Data Package								
VCL = Verification Checklist								
PQAR = Preliminary Quality Assurance Report								
FQAR = Final Quality Assurance Record								

9713515.0596

RECEIVED
JUL 22 1993
VALIDATION DOCUMENTATION
SDLA

HCRL-WHC/GPCL--L-92-063 112 E-93-06/2978-50

9713515.0597

originals

WESTINGHOUSE HANFORD COMPANY
300-FF-5 RI DATA VALIDATION
DISTRIBUTION FORM

Document Title: Prelim. QA Records Trip Case. # N1-12-028-9573

Document Number: HCRL-WHC/GPCL--L-92-063 Date: 12/17/92

DISTRIBUTION

M. Baker (HCRL)		D. Mantooth (ERL)	X	B. Ulbricht (ERL)	
P. Barney (ERL)		T. McDonald (HCRL)		D. Wiley (ERL)	
Y. Chun (HCSEA)		B. Porter (HCRL)		N. Wold (ERL)	
B. Downs (HCSEA)		K. Rolla (HCSEA)		Project File (HCRL)	X
M. Gerdom (HCRL)	X	C. Russel (HCSEA)		Duplicate Project File (HCSEA)	X
J. Grover (ERL)		C. Sater (ERL)		Westinghouse EDMC	X
L. Hammers (HCSEA)		M. Schwartz (ERL)			
L. Huszagh (WHC)	X	J. Shan (HCSEA)			

Project Files (1=Adm: 2=Corres: 3=Source Information: 4=Technical Data & Products)

1.1	File Index	2.1	Incoming Correspondence	4.4.5	Biota/Small Mammals
1.2	Distribution Lists	2.2	Outgoing Correspondence	X	4.4.6	Surface Water/Sediments
1.3	Project Procedures	2.3	Internal Correspondence	4.5	Data Val. & Qual. Summary Rpts.
1.4	Project Modifications			4.5.1	Round 1 Groundwater
1.5.1	Staff Resumes	3.1	Task Order	4.5.1.1	Internal Drafts/Comments/Resol.
1.5.2	Staff Training	3.2	Sample Lists	4.5.1.2	WHC Review Draft/Comments/Resol.
1.5.3	Auth./Former Site Employee	3.3	Data Validation Procedures	4.5.1.3	Final Report
1.6.1	QA Manual	3.4	Original Chemical Data	4.5.2	Round 2 Groundwater
1.6.2	QA Implementation	3.5	Original Radiochem Data	4.5.2.1	Internal Drafts/Comments/Resol.
1.6.3.1	QA Audits-Deliverables			4.5.2.2	WHC Review Draft/Comments/Resol.
1.6.3.2	QA Audits-Files	4.1	Task Plan	4.5.2.3	Final Report
1.6.4.1	Audit Resps-Deliverables	4.2	Data Val. Completeness Verif.	4.5.3	Round 3 Groundwater
1.6.4.2	Audit Resps-Files	4.2.1	Checklists - Round 1 GW	4.5.3.1	Internal Drafts/Comments/Resol.
1.6.5	Training	4.2.2	Checklists - Round 2 GW	4.5.3.2	WHC Review Draft/Comments/Resol.
1.6.6.1	QA Manual Doc Log	4.2.3	Checklists - Round 3 GW	4.5.3.3	Final Report
1.6.6.2	Procedures Doc Log	4.2.4	Checklists - Round 4 GW	4.5.4	Round 4 Groundwater
1.6.6.3	Plans Document Log	4.2.5	Checklists - Biota/Small Mam	4.5.4.1	Internal Drafts/Comments/Resol.
1.6.6.4	Deliverables Doc Log	4.2.6	Checklists - Surface Wtr./Sed.	4.5.4.2	WHC Review Draft/Comments/Resol.
1.7.1	Downloads	4.3	Data Val. Calcs. Annotated CP	4.5.4.3	Final Report
1.7.2	M-113s	4.3.1	Round 1 Groundwater	4.5.5	Biota/Small Mammals
1.7.3	A-208s	4.3.2	Round 2 Groundwater	4.5.5.1	Internal Drafts/Comments/Resol.
1.7.4	Budget Status	4.3.3	Round 3 Groundwater	4.5.5.2	WHC Review Draft/Comments/Resol.
1.7.5	Invoices	4.3.4	Round 4 Groundwater	4.5.5.3	Final Report
1.8.1	Requisitions	4.3.5	Biota/Small Mammals	4.5.6	Surface Water/Sediments
1.9	Meeting Minutes	4.3.6	Surface Water/Sediments	4.5.6.1	Internal Drafts/Comments/Resol.
1.10	Record of Telecons	4.4	Preliminary QA Records	4.5.6.2	WHC Review Draft/Comments/Resol.
1.11	Progress Reports	4.4.1	Round 1 Groundwater	X	4.5.6.3	Final Report
1.12	Subcontractor (HCL)	4.4.2	Round 2 Groundwater	4.6	Weekly Status Reports
		4.4.3	Round 3 Groundwater	4.7	Weekly Management Reports
		4.4.4	Round 4 Groundwater		

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THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides a copy of the as-received sample concentration reports. This may be a tabular summary similar to that provided in Attachment 4, or may be a copy of the laboratory reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary of all data qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

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ATTACHMENT 1

Glossary of Data Qualifiers

971515.0900

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

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

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TMA

ATTACHMENT 1 DATA TABLE

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DH7 (water)	1	Gross Alpha	(-0.0392 ± 1.81)	E+00
		Gross Beta	(0.794 ± 1.62)	E+00
		^{3}H	(-1.18 ± 1.15)	E+02
		^{234}U	(8.32 ± 0.918)	E-01
		^{235}U	(5.22 ± 2.50)	E-02
		^{238}U	(7.77 ± 0.873)	E-01
		Gamma Scan:		
		^{40}K	<8.441	E+00
		^{51}Cr	<5.470	E+02
		^{60}Co	<1.172	E+00
		^{65}Zn	<2.679	E+00
		^{134}Cs	<9.344	E-01
		^{137}Cs	<6.884	E-01
		^{226}Ra	<1.477	E+00
		^{228}Th	<1.412	E+00
		^{232}Th	<3.181	E+00
B01DJ0 (water)	2	Gross Alpha	(-0.0710 ± 1.12)	E+00
		Gross Beta	(3.83 ± 1.56)	E+00
		^{3}H	(0.355 ± 1.22)	E+02
		^{90}Sr	(0.0316 ± 1.65)	E+00
		^{99}Tc	(9.96 ± 5.20)	E+00
		^{129}I	(1.43 ± 2.63)	E+00
		^{234}U	(2.30 ± 2.05)	E-02
		^{235}U	(-0.620 ± 1.24)	E-02
		^{238}U	(0.768 ± 1.02)	E-02
		^{238}Pu	(1.82 ± 7.28)	E-03
		^{239}Pu	(0 ± 3.63)	E-03
		^{241}Pu	(-1.40 ± 0.0728)	E+00
		Gamma Scan:		
		^{40}K	<2.016	E+02
		^{51}Cr	<7.086	E+03
		^{60}Co	<1.787	E+01
		^{65}Zn	<5.339	E+01
		^{134}Cs	<1.689	E+01
		^{137}Cs	<1.500	E+01
		^{226}Ra	<2.880	E+01
		^{228}Th	<2.432	E+01
		^{232}Th	<5.446	E+01

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ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DJ3 (water)	3	Gross Alpha	(-0.520 ± 2.09)	E+00
		Gross Beta	(6.02 ± 1.48)	E+00
		^{3}H	(-0.279 ± 1.14)	E+02
		^{90}Sr	(0 ± 1.46)	E+00
		^{99}Tc	(2.83 ± 2.77)	E+00
		^{129}I	(0.732 ± 3.08)	E+00
		^{234}U	(5.86 ± 3.71)	E-02
		^{235}U	(-0.746 ± 1.49)	E-02
		^{238}U	(5.86 ± 3.10)	E-02
		^{238}Pu	(2.22 ± 8.86)	E-03
		^{239}Pu	(2.21 ± 8.83)	E-03
		^{241}Pu	(0.163 ± 0.652)	E+00
		Gamma Scan:		
		^{40}K	<2.304	E+02
		^{51}Cr	<6.769	E+03
		^{60}Co	<1.230	E+01
		^{65}Zn	<4.039	E+01
		^{134}Cs	<1.399	E+01
		^{137}Cs	<1.310	E+01
		^{226}Ra	<2.315	E+01
		^{228}Th	<2.289	E+01
		^{232}Th	<5.239	E+01
B01DL7 (water)	4	Gross Alpha	(27.8 ± 4.60)	E+00
		Gross Beta	(29.1 ± 2.37)	E+00
		^{3}H	(5.03 ± 0.297)	E+03
		^{90}Sr	(0.257 ± 0.135)	E+00
		^{99}Tc	(7.71 ± 3.49)	E+00
		^{129}I	(0.936 ± 1.46)	E+00
		^{234}U	(2.06 ± 0.111)	E+01
		^{235}U	(1.47 ± 0.153)	E+00
		^{238}U	(1.99 ± 0.107)	E+01
		^{238}Pu	(-2.41 ± 9.64)	E-03
		^{239}Pu	(2.40 ± 4.80)	E-03
		^{241}Pu	(0.387 ± 0.774)	E+00
		Gamma Scan:		
		^{40}K	<1.273	E+02
		^{51}Cr	<3.970	E+03
		^{60}Co	<1.016	E+01
		^{65}Zn	<1.847	E+01
		^{134}Cs	<7.909	E+00
		^{137}Cs	<7.581	E+00
		^{226}Ra	<1.224	E+01
		^{228}Th	<2.755	E+01
		^{232}Th	<3.038	E+01

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ATTACHMENT 4

As Qualified Data Summary

Gross Alpha (CRDL = 3 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	-0.039	UJ
BO1DJ0	-0.071	UJ
BO1DJ3	-0.520	UJ
BO1DL7	27.800	J
BO1DN8	2.560	J
BO1DY5	8.830	J
BO1DY7	20.000	J
BO1DY9	14.300	J
BO1DZ1	6.160	J

Gross Beta (CRDL = 4 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	0.794	U
BO1DJ0	3.830	
BO1DJ3	6.020	
BO1DL7	29.100	
BO1DN8	34.100	
BO1DY5	12.200	
BO1DY7	30.900	
BO1DY9	10.700	
BO1DZ1	9.430	

Tritium (CRDL = 400 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	-118.000	UJ
BO1DJ0	35.500	UJ
BO1DJ3	-27.900	UJ
BO1DL7	5030.000	J
BO1DN8	31.000	UJ
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Strontium 90 (CRDL = 2 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	0.032	UJ
BO1DJ3	0.000	UJ
BO1DL7	0.257	J
BO1DN8	0.000	UJ
BO1DY5	0.253	UJ
BO1DY7	-1.210	UJ
BO1DY9	-2.290	UJ
BO1DZ1	0.278	UJ

Tech 99 (CRDL = 15 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	9.960	UJ
BO1DJ3	2.830	UJ
BO1DL7	7.710	J
BO1DN8	62.700	J
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Iodine 129 (CRDL = 5 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	1.430	UJ
BO1DJ3	0.732	UJ
BO1DL7	0.936	UJ
BO1DN8	-1.030	UJ
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Isotopic Uranium

U234 (CRDL = 1 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	0.832	
BO1DJ0	0.023	
BO1DJ3	0.059	
BO1DL7	20.600	
BO1DN8	2.300	
BO1DY5	6.470	
BO1DY7	11.200	
BO1DY9	6.820	
BO1DZ1	5.860	

U235 (CRDL = 1 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	0.052	
BO1DJ0	-0.006	U
BO1DJ3	-0.007	U
BO1DL7	1.470	
BO1DN8	0.118	
BO1DY5	0.539	
BO1DY7	76.200	
BO1DY9	0.341	
BO1DZ1	0.353	

U238 (CRDL = 1 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	0.777	
BO1DJ0	0.008	U
BO1DJ3	0.059	
BO1DL7	19.900	
BO1DN8	2.100	
BO1DY5	5.860	
BO1DY7	11.400	
BO1DY9	6.710	
BO1DZ1	5.850	

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ATTACHMENT 3

Summary of Data Qualifications

ATTACHMENT 1 DATA TABLE (cont'd, page four)

TMA

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DY7 (water)	7	Gross Alpha	(20.0 ± 2.75)	E+00
		Gross Beta	(30.9 ± 1.76)	E+00
		^{90}Sr	(-1.21 ± 1.71)	E+00
		^{234}U	(1.12 ± 0.0913)	E+01
		^{235}U	(7.62 ± 1.50)	E+01
		^{238}U	(1.14 ± 0.0930)	E+01
		Gamma Scan:		
		^{40}K	<9.827	E+01
		^{51}Cr	<6.407	E+03
		^{60}Co	<1.848	E+01
		^{65}Zn	<3.957	E+01
		^{134}Cs	<1.425	E+01
		^{137}Cs	<1.160	E+01
		^{226}Ra	<2.174	E+01
		^{228}Th	<3.396	E+01
		^{232}Th	<5.205	E+01
B01DY9 (water)	8	Gross Alpha	(14.3 ± 2.75)	E+00
		Gross Beta	(10.7 ± 1.37)	E+00
		^{90}Sr	(-2.29 ± 2.81)	E+00
		^{234}U	(6.82 ± 0.607)	E+00
		^{235}U	(3.41 ± 0.947)	E-01
		^{238}U	(6.71 ± 0.594)	E+00
		Gamma Scan:		
		^{40}K	<2.561	E+02
		^{51}Cr	<7.101	E+03
		^{60}Co	<1.652	E+01
		^{65}Zn	<4.142	E+01
		^{134}Cs	<1.720	E+01
		^{137}Cs	<1.379	E+01
		^{226}Ra	<2.469	E+01
		^{228}Th	<2.371	E+01
		^{232}Th	<5.549	E+01
B01DZ1 (water)	9	Gross Alpha	(6.16 ± 1.60)	E+00
		Gross Beta	(9.43 ± 1.46)	E+00
		^{90}Sr	(0.278 ± 0.368)	E+00
		^{234}U	(5.86 ± 0.529)	E+00
		^{235}U	(3.53 ± 1.00)	E-01
		^{238}U	(5.85 ± 0.522)	E+00
		Gamma Scan:		
		^{40}K	<9.270	E+01
		^{51}Cr	<4.070	E+03
		^{60}Co	<1.316	E+01
		^{65}Zn	<2.674	E+01
		^{134}Cs	<9.978	E+00
		^{137}Cs	<8.151	E+00
		^{226}Ra	<1.439	E+01
		^{228}Th	<2.867	E+01
		^{232}Th	<3.281	E+01

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DN8 (water)	5	Gross Alpha	(2.56 ± 2.54)	E+00
		Gross Beta	(34.1 ± 2.49)	E+00
		^{3}H	(0.310 ± 1.19)	E+02
		^{90}Sr	(0 ± 1.56)	E+00
		^{99}Tc	(6.27 ± 0.784)	E+01
		^{129}I	(-1.03 ± 3.18)	E+00
		^{234}U	(2.30 ± 0.215)	E+00
		^{235}U	(1.18 ± 0.494)	E-01
		^{238}U	(2.10 ± 0.203)	E+00
		^{238}Pu	(-1.75 ± 3.51)	E-03
		^{239}Pu	(3.49 ± 3.50)	E-03
		^{241}Pu	(0.848 ± 0.848)	E+00
		Gamma Scan:		
		^{40}K	<1.431	E+02
		^{51}Cr	<4.393	E+03
		^{60}Co	<9.150	E+00
		^{65}Zn	<2.642	E+01
		^{134}Cs	<9.593	E+00
		^{137}Cs	<7.911	E+00
		^{226}Ra	<1.361	E+01
		^{228}Th	<1.420	E+01
		^{232}Th	<3.669	E+01
B01DY5 (water)	6	Gross Alpha	(8.83 ± 1.69)	E+00
		Gross Beta	(12.2 ± 1.38)	E+00
		^{90}Sr	(0.253 ± 1.27)	E+00
		^{234}U	(6.47 ± 0.545)	E+00
		^{235}U	(5.39 ± 1.18)	E-01
		^{238}U	(5.86 ± 0.503)	E+00
		Gamma Scan:		
		^{40}K	<7.885	E+01
		^{51}Cr	<3.785	E+03
		^{60}Co	<7.599	E+00
		^{65}Zn	<1.853	E+01
		^{134}Cs	<7.881	E+00
		^{137}Cs	<6.583	E+00
		^{226}Ra	<1.347	E+01
		^{228}Th	<1.431	E+01
		^{232}Th	<2.804	E+01

Isotopic Plutonium

Pu238 (CRDL = 1 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	0.002	UJ
BO1DJ3	0.002	UJ
BO1DL7	-0.002	UJ
BO1DN8	-0.002	UJ
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Pu239 (CRDL = 1 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	0.000	UJ
BO1DJ3	0.002	UJ
BO1DL7	0.002	UJ
BO1DN8	0.003	UJ
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Pu241 (CRDL = 15 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	NR	
BO1DJ0	-1.400	R
BO1DJ3	0.163	R
BO1DL7	0.387	R
BO1DN8	0.848	R
BO1DY5	NR	
BO1DY7	NR	
BO1DY9	NR	
BO1DZ1	NR	

Gamma Spec

Cobalt 60 (CRDL = 25 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	1.172	UJ
BO1DJ0	17.870	U
BO1DJ3	12.300	U
BO1DL7	10.160	U
BO1DN8	9.150	U
BO1DY5	7.599	U
BO1DY7	18.480	U
BO1DY9	16.520	U
BO1DZ1	13.160	U

Cesium 137 (CRDL = 15 pCi/l)

Customer I.D. #	Reported Results	Q
BO1DH7	0.688	UJ
BO1DJ0	15.000	U
BO1DJ3	13.100	U
BO1DL7	7.581	U
BO1DN8	7.911	U
BO1DY5	6.583	U
BO1DY7	11.600	U
BO1DY9	13.790	U
BO1DZ1	8.150	U

Thorium 228 (CRDL = Not reported)

Customer I.D. #	Reported Results	Q
BO1DH7	1.412	UJ
BO1DJ0	24.320	U
BO1DJ3	22.890	U
BO1DL7	27.550	U
BO1DN8	14.200	U
BO1DY5	14.300	U
BO1DY7	33.960	U
BO1DY9	23.710	U
BO1DZ1	28.670	U

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"J" due to poor accuracy - Gross α, I-129**
"J" due to poor precision - Gross α, H3, Sr90, Tc-99, Iso-Pu,
"J" due to Holding Time >6 months - All Tc, BO1DH7 Gamma Scan.
"J" due to Blanks - none

TMA

ATTACHMENT 1 DATA TABLE

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
BO1DH7 (water)	1	Gross Alpha	(-0.0392 ± 1.81)	E+00 UJ
		Gross Beta	(0.794 ± 1.62)	E+00 U
		^{3}H	(-1.18 ± 1.15)	E+02 UJ
		^{234}U	(8.32 ± 0.918)	E-01
		^{235}U	(5.22 ± 2.50)	E-02
		^{238}U	(7.77 ± 0.873)	E-01
		>6 months Gamma Scan:		
		^{40}K	<8.441	E+00
		^{51}Cr	<5.470	E+02
		^{60}Co	<1.172	E+00 U
		^{65}Zn	<2.679	E+00
		^{134}Cs	<9.344	E-01
		^{137}Cs	<6.884	E-01 U
		^{226}Ra	<1.477	E+00
		^{228}Th	<1.412	E+00 U
		^{232}Th	<3.181	E+00
BO1DJ0 (water)	2	Gross Alpha	(-0.0710 ± 1.12)	E+00 UJ
		Gross Beta	(3.83 ± 1.56)	E+00
		^{3}H	(0.355 ± 1.22)	E+02 UJ
		^{90}Sr	(0.0316 ± 1.65)	E+00 UJ
		>6 months ^{99}Tc	(9.96 ± 5.20)	E+00 UJ
		^{129}I	(1.43 ± 2.63)	E+00 UJ
		^{234}U	(2.30 ± 2.05)	E-02
		^{235}U	(-0.620 ± 1.24)	E-02 U
		^{238}U	(0.768 ± 1.02)	E-02 U
		^{238}Pu	(1.82 ± 7.28)	E-03 UJ
		^{239}Pu	(0 ± 3.63)	E-03 UJ
		^{241}Pu	(-1.40 ± 0.0728)	E+00 R
		Gamma Scan:		
		^{40}K	<2.016	E+02
		^{51}Cr	<7.086	E+03
		^{60}Co	<1.787	E+01 U
		^{65}Zn	<5.339	E+01
		^{134}Cs	<1.689	E+01
		^{137}Cs	<1.500	E+01 U
		^{226}Ra	<2.880	E+01
		^{228}Th	<2.432	E+01 U
		^{232}Th	<5.446	E+01

requested but missing
Sr-90
Iso-Pu
I-129
Tc-99
Analysis ~~Sample~~ These were Deleted Due to Loss of Sample. Documented on Record of Disposition. 3rd was also cancelled but supplied.

OK

Notes
All Tc99 >6 months holding time

RDL - Co^{60} - 25 pCi/L
Cs^{137} 15 pCi/L
Th^{232} not Listed

* All Pu-241 results are qualified "R" - no MDA reported or calculated. Since background counting time not provided, cannot determine if detect or nondetect
** one spike >120%, however all results << MDA, other spike acceptable

ATTACHMENT 1 DATA TABLE (cont'd, page two)

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DJ3 (water)	3	Gross Alpha	(-0.520 ± 2.09)	E+00 UJ
		Gross Beta	(6.02 ± 1.48)	E+00
		^{3}H	(-0.279 ± 1.14)	E+02 UJ
		^{90}Sr	(0 ± 1.46)	E+00 UJ
		>6 months ^{99}Tc	(2.83 ± 2.77)	E+00 UJ
OK		^{129}I	(0.732 ± 3.08)	E+00 UJ
		^{234}U	(5.86 ± 3.71)	E-02
		^{235}U	(-0.746 ± 1.49)	E-02 U
		^{238}U	(5.86 ± 3.10)	E-02
		^{238}Pu	(2.22 ± 8.86)	E-03 UJ
		^{239}Pu	(2.21 ± 8.83)	E-03 UJ
		^{241}Pu	(0.163 ± 0.652)	E+00 *
		Gamma Scan:		
		^{40}K	<2.304	E+02
		^{51}Cr	<6.769	E+03
		^{60}Co	<1.230	E+01 U
		^{65}Zn	<4.039	E+01
		^{134}Cs	<1.399	E+01
		^{137}Cs	<1.310	E+01 U
		^{226}Ra	<2.315	E+01
		^{228}Th	<2.289	E+01 U
		^{232}Th	<5.239	E+01
B01DL7 (water)	4	Gross Alpha	(27.8 ± 4.60)	E+00 J
		Gross Beta	(29.1 ± 2.37)	E+00
		^{3}H	(5.03 ± 0.297)	E+03 J
		^{90}Sr	(0.257 ± 0.135)	E+00 J
OK		>6 months ^{99}Tc	(7.71 ± 3.49)	E+00 J
		^{129}I	(0.936 ± 1.46)	E+00 UJ
		^{234}U	(2.06 ± 0.111)	E+01
		^{235}U	(1.47 ± 0.153)	E+00
		^{238}U	(1.99 ± 0.107)	E+01
		^{238}Pu	(-2.41 ± 9.64)	E-03 UJ
		^{239}Pu	(2.40 ± 4.80)	E-03 UJ
		^{241}Pu	(0.387 ± 0.774)	E+00 *
		Gamma Scan:		
		^{40}K	<1.273	E+02
		^{51}Cr	<3.970	E+03
		^{60}Co	<1.016	E+01 U
		^{65}Zn	<1.847	E+01
		^{134}Cs	<7.909	E+00
		^{137}Cs	<7.581	E+00 U
		^{226}Ra	<1.224	E+01
		^{228}Th	<2.755	E+01 U
		^{232}Th	<3.038	E+01

* Also missing chemical yield information.

ATTACHMENT 1 DATA TABLE (cont'd, page three)

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DN8 ✓ (water)	5	Gross Alpha	(2.56 ± 2.54)	E+00 J
		Gross Beta	(34.1 ± 2.49)	E+00
		^{3}H	(0.310 ± 1.19)	E+02 UJ
OK		^{90}Sr	(0 ± 1.56)	E+00 UJ
	>6 months	^{99}Tc	(6.27 ± 0.784)	E+01 J
		^{129}I	(-1.03 ± 3.18)	E+00 UJ
		^{234}U	(2.30 ± 0.215)	E+00
		^{235}U	(1.18 ± 0.494)	E-01
		^{238}U	(2.10 ± 0.203)	E+00
		^{238}Pu	(-1.75 ± 3.51)	E-03 UJ
		^{239}Pu	(3.49 ± 3.50)	E-03 UJ
		^{241}Pu	(0.848 ± 0.848)	E+00 *
		Gamma Scan:		
		^{40}K	<1.431	E+02
		^{51}Cr	<4.393	E+03
		^{60}Co	<9.150	E+00 U
		^{65}Zn	<2.642	E+01
		^{134}Cs	<9.593	E+00
		^{137}Cs	<7.911	E+00 U
		^{226}Ra	<1.361	E+01
		^{228}Th	<1.420	E+01 UJ
		^{232}Th	<3.669	E+01
B01DY5 ✓ (water)	6	Gross Alpha	(8.83 ± 1.69)	E+00 J
		Gross Beta	(12.2 ± 1.38)	E+00
		^{90}Sr	(0.253 ± 1.27)	E+00 UJ
requested		^{234}U	(6.47 ± 0.545)	E+00
		^{235}U	(5.39 ± 1.18)	E-01
Iso - Pu - missing		^{238}U	(5.86 ± 0.503)	E+00
		Gamma Scan:		
Iso - U - not needed		^{40}K	<7.885	E+01
		^{51}Cr	<3.785	E+03
		^{60}Co	<7.599	E+00 U
		^{65}Zn	<1.853	E+01
		^{134}Cs	<7.881	E+00
		^{137}Cs	<6.583	E+00 U
		^{226}Ra	<1.347	E+01
		^{228}Th	<1.431	E+01 UJ
		^{232}Th	<2.804	E+01

These were missmarked in the request for Analysis! AND the Pu should be U. Data OK

* also missing chemical yield information.

9713515.0613

ATTACHMENT 1 DATA TABLE (cont'd, page four)

TMA

Collection date: 12/02/91 - 12/03/91

Customer I.D.	TMA/Norcal Group No. 9573	Analysis	Results pCi/L ± 2 σ	
B01DY7 (water)	7	Gross Alpha	(20.0 ± 2.75)	E+00 J
		Gross Beta	(30.9 ± 1.76)	E+00
		^{90}Sr	(-1.21 ± 1.71)	E+00 UJ
		^{234}U	(1.12 ± 0.0913)	E+01
		^{235}U	(7.62 ± 1.50)	E+01
		^{238}U	(1.14 ± 0.0930)	E+01
		Gamma Scan:		
		^{40}K	<9.827	E+01
		^{51}Cr	<6.407	E+03
		^{60}Co	<1.848	E+01 U
		^{65}Zn	<3.957	E+01
		^{134}Cs	<1.425	E+01
		^{137}Cs	<1.160	E+01 U
		^{226}Ra	<2.174	E+01
		^{228}Th	<3.396	E+01 UJ
		^{232}Th	<5.205	E+01
B01DY9 (water)	8	Gross Alpha	(14.3 ± 2.75)	E+00 J
		Gross Beta	(10.7 ± 1.37)	E+00
		^{90}Sr	(-2.29 ± 2.81)	E+00 UJ
		^{234}U	(6.82 ± 0.607)	E+00
		^{235}U	(3.41 ± 0.947)	E-01
		^{238}U	(6.71 ± 0.594)	E+00
		Gamma Scan:		
		^{40}K	<2.561	E+02
		^{51}Cr	<7.101	E+03
		^{60}Co	<1.652	E+01 U
		^{65}Zn	<4.142	E+01
		^{134}Cs	<1.720	E+01
		^{137}Cs	<1.379	E+01 U
		^{226}Ra	<2.469	E+01
		^{228}Th	<2.371	E+01 U
		^{232}Th	<5.549	E+01
B01DZ1 (water)	9	Gross Alpha	(6.16 ± 1.60)	E+00 J
		Gross Beta	(9.43 ± 1.46)	E+00
		^{90}Sr	(0.278 ± 0.368)	E+00 UJ
		^{234}U	(5.86 ± 0.529)	E+00
		^{235}U	(3.53 ± 1.00)	E-01
		^{238}U	(5.85 ± 0.522)	E+00
		Gamma Scan:		
		^{40}K	<9.270	E+01
		^{51}Cr	<4.070	E+03
		^{60}Co	<1.316	E+01 U
		^{65}Zn	<2.674	E+01
		^{134}Cs	<9.978	E+00
		^{137}Cs	<8.151	E+00 U
		^{226}Ra	<1.439	E+01
		^{228}Th	<2.867	E+01 U
		^{232}Th	<3.281	E+01

requested
Iso - Pu (missing)
~~Iso - U~~ (not requested)

Reported value = 0.762

Data mis-marked. Pu should be U's. Data ok

requested
Iso - Pu (missing)
Iso - U (not requested)

requested
Iso - Pu - missing
Iso U (not requested)

9713515.0614

ATTACHMENT 5

Data Review Supporting Documentation

971515.0615

Data Package Completeness Checklists

TMA/Norcal N1-12-028-9573

B01DH7
B01DJ0
B01DJ3
B01DL7
B01DN8
B01DY5
B01DY7
B01DY9
B01DZ1

Gross α/β

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- NA Weights of Carriers Added, If Applicable
- NA Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- NA Results of Statistical Test Used to Evaluate Instrument Background
- NA Control Limits for Check Source and Background Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

_____ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
_____ Weights of Precipitates or Solids Counted
_____ Calculated Recoveries

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Aliquots of Samples
✓ Weights of Solids Counted
✓ Count Durations
✓ Sample Identifications
✓ Calculated Precision

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses

SR-90

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

missing:
B01DH7 (not logged in according to log-in verif.)

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- ✓ Weights of Carriers Added, If Applicable
- ✓ Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- ✓ Results of Statistical Test Used to Evaluate Instrument Background
- NA Control Limits for Check Source and Background Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- NO MDA of Method will calculate
- ✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Aliquots of Samples
- ✓ Weights of Solids Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

TC-99

Supplemental Requirements for Analyses Using Gas Proportional Counters

A.0 Completeness Checklist

Analysis Results

missing: B0ID47

B0ID47 HAD 99TC LATER CANCELLED DATA ok

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Counting Logs, Printouts, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Prepared or Counted
- ✓ Weights of Solids Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
- ✓ Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Weights of Preparations
- ✓ Efficiencies
- NA Weights of Carriers Added, If Applicable
- NA Results of Statistical Tests Used to Evaluate Instrument Reliability and Efficiency Checks
- ✓ Raw Data of Background Counts and Count Duration
- NA Results of Statistical Test Used to Evaluate Instrument Background
- NA Control Limits for Check Source and Background Counts

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- NO MDA of Method will calculate
- ✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Gas Proportional Counters (Cont.)

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Aliquots of Samples
- ✓ Weights of Solids Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

Supplemental Requirements for the Analysis of Tritium Using Liquid Scintillation Counting

F.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration) no notebook page
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Instrument Identification
- ✓ Analysis Date and Analyst Initials
- ✓ Sample Weight

Initial and Continuing Instrument Calibration

- ✓ Instrument Identification
- ✓ Identification of Calibration Standards including Radionuclides, Certification, Issue or Expiration Date and Activity
- NA Amount of Standard Used for Calibration
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
- ✓ Counting Efficiency Determination Method and Results
- ✓ Quench Correction Method

Blanks

- ✓ Instrument Identification
- ✓ Date of Analysis
- ✓ MDA of Method
- ✓ Amounts of Reagents Used
- NA Lot Numbers of Reagents Used
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, Background Count Duration)
- ✓ Tritium Levels in Background Water

Duplicates

- ✓ Instrument Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- NA Amount of Spike for Spiked Duplicates

9713515.0623

✓ Raw Data (Gross Counts, Count Duration, Background Counts, and Background Count Duration)

Radiometric Yields

✓ Amount of Tritium Standard Used for Radiometric Yield Determination

✓ Radiometric Yield Calculations and Results

Laboratory Control Samples

✓ Sample Identification

✓ Instrument Identification

✓ Date of Analysis

✓ Calculated Recoveries

✓ Results of Analyses

F.1 General

Scope

This Appendix provides supplemental information used for validating analytical data from the determination of tritium in water using liquid scintillation counting.

Applicability

The validation criteria in this appendix are intended to be applied in addition to those found in the body of the procedure. In cases where discrepancies exist between the requirements of the procedure and the appendix, the criteria in the appendix shall apply.

F.2 Calibration

Liquid scintillation counting systems are calibrated using NIST traceable external or internal standards. The chemical and physical matrix of the standards should resemble the samples as closely as possible in order to match light emission (scintillation) and quenching properties.

- If the matrix of the standard is not representative of that for the samples, qualify all associated results as estimated, (J).

Supplemental Requirements for the Analysis of Pu-241 Using Liquid Scintillation Counting

F.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ___ Instrument Identification
- ✓ Analysis Date and Analyst Initials
- ✓ Sample Weight

missing:
B01DH7
B01DY5
B01DY7
B01DY9
B01DZ1

these were mis-marked. they should have been ~~Pu~~ Analysis
DATA OK

Initial and Continuing Instrument Calibration

- ✓ Instrument Identification
- ✓ Identification of Calibration Standards including Radionuclides, Certification, Issue or Expiration Date and Activity
- NA Amount of Standard Used for Calibration
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, and Background Count Duration)
- ✓ Counting Efficiency Determination Method and Results
- NA Quench Correction Method

Blanks

- ✓ Instrument Identification
- ✓ Date of Analysis
- NO MDA of Method will calculate
- ✓ Amounts of Reagents Used
- NA Lot Numbers of Reagents Used
- ✓ Raw Data (Gross Counts, Count Duration, Background Count, Background Count Duration)
- ✓ ~~Tritium~~ Pu-241 Levels in Background Water

Duplicates

- ✓ Instrument Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- NA Amount of Spike for Spiked Duplicates

9713515.0625

✓ Raw Data (Gross Counts, Count Duration, Background Counts, and Background Count Duration)

Radiometric Yields

✓ Amount of ~~Tritium~~ Tracer/Carrier Standard Used for Radiometric Yield Determination

✓ Radiometric Yield Calculations and Results

Laboratory Control Samples

✓ Sample Identification

✓ Instrument Identification

✓ Date of Analysis

✓ Calculated Recoveries

✓ Results of Analyses

F.1 General

Scope

This Appendix provides supplemental information used for validating analytical data from the determination of tritium in water using liquid scintillation counting.

Applicability

The validation criteria in this appendix are intended to be applied in addition to those found in the body of the procedure. In cases where discrepancies exist between the requirements of the procedure and the appendix, the criteria in the appendix shall apply.

F.2 Calibration

Liquid scintillation counting systems are calibrated using NIST traceable external or internal standards. The chemical and physical matrix of the standards should resemble the samples as closely as possible in order to match light emission (scintillation) and quenching properties.

- If the matrix of the standard is not representative of that for the samples, qualify all associated results as estimated, (J).

Iso-U

Supplemental Requirements for Analyses Using Alpha Spectroscopy

B.0 Completeness Checklist

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted (Precipitated or Deposited)

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Spectra or Counts per Channel
NA Kev/channel
NA Count Duration for Standards
✓ Efficiencies
NA Raw Data of Background Counts, Dates Counted, and Duration of Counts

Blanks

✓ Detector Identification
✓ Date of Analysis
✓ MDA of Method
✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Alpha Spectroscopy (Cont.)

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

9715515.0528

Iso-Pu

Supplemental Requirements for Analyses Using Alpha Spectroscopy

B.0 Completeness Checklist

Analysis Results

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted (Precipitated or Deposited)

missing:
B01DH7
B01DY5
B01DY7
B01DY9
B01DZ1

Should be U(iso) Analysis Data OK?

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclide, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Spectra or Counts per Channel
NA Kev/channel
NA Count Duration for Standards
✓ Efficiencies
NA Raw Data of Background Counts, Dates Counted, and Duration of Counts

Blanks

✓ Detector Identification
✓ Date of Analysis
✓ MDA of Method
✓ Amounts of Reagents Used in Blank

Supplemental Requirements for Analyses Using Alpha Spectroscopy (Cont.)

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples Counted
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Calculated Precision

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

Supplemental Requirements for Analyses Using Gamma Spectroscopy

Gamma D.

C.0 Completeness Checklist

Analysis Results

- ✓ Results Report for Sample Analyses and Reanalyses
- ✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
- ✓ Calculation Sheets
- ✓ Sample Identifications
- ✓ Detector Identification and Counting Position
- ✓ Analysis Date and Initials of Analyst
- ✓ Amounts of Samples Counted

Initial and Continuing Calibration

- ✓ Detector Identification
- ✓ Calibration Date(s) and Initials of Analyst
- ✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
- NA Amount of (Check) Standard Used
- ✓ Raw Data including Counts and Count Duration for Standards
- ✓ Efficiencies and/or Geometry and Matrix Factors
- ✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
- ✓ Kev/Channel
- ✓ FWHM

Blanks

- ✓ Detector Identification
- ✓ Date of Analysis
- NO MDA of Method will calculate
- ✓ Amounts of Reagents Used in Blank
- ✓ Raw Data raw data for 7003-20 (QC 7548) in SDG 7003

Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

✓ Detector Identification
✓ Date of Analysis
✓ Amounts of Samples
✓ Count Durations
✓ Sample Identifications
✓ Results of Analyses and Calculated Precision
✓ Raw Data data for 7003-21 (QC 7549) in SDG 7003

Radiometric and Gravimetric Yields

NA

____ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
____ Weights of Precipitates or Solids Counted
____ Calculated Recoveries

Laboratory Control Samples

✓ Detector Identification
✓ Date of Analysis
✓ Calculation of Recoveries
✓ Results of Analyses data for 7003-19 (QC 7547) in SDG 7003

9713515.0632

Supplemental Requirements for Analyses Using
Gamma Spectroscopy

C.0 Completeness Checklist I-129

Analysis Results

missing: 301DH7

Boldhn had not delete data

✓ Results Report for Sample Analyses and Reanalyses
✓ Raw Data (Spectra, Printouts of Counts per Channel, Notebook Pages)
✓ Calculation Sheets
✓ Sample Identifications
✓ Detector Identification and Counting Position
✓ Analysis Date and Initials of Analyst
✓ Amounts of Samples Counted

Initial and Continuing Calibration

✓ Detector Identification
✓ Calibration Date(s) and Initials of Analyst
✓ Identification of Calibration and Check Standards including Radionuclides, Certification, Expiration Date, and Activity
NA Amount of (Check) Standard Used
✓ Raw Data including Counts and Count Duration for Standards
✓ Efficiencies and/or Geometry and Matrix Factors
✓ Raw Data of Background Counts, Count Dates, and Duration of Counts
✓ Kev/Channel
✓ FWHM

Blanks

✓ Detector Identification
✓ Date of Analysis
NO MDA of Method will calculate
✓ Amounts of Reagents Used in Blank
✓ Raw Data

Supplemental Requirements for Analyses Using Gamma Spectroscopy (Cont.)

Duplicates

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Amounts of Samples
- ✓ Count Durations
- ✓ Sample Identifications
- ✓ Results of Analyses and Calculated Precision
- ✓ Raw Data

Radiometric and Gravimetric Yields

- ✓ Amounts (Volumes, Concentrations, Activity) of Spikes, Tracers, or Carriers Used
- ✓ Weights of Precipitates or Solids Counted
- ✓ Calculated Recoveries

Laboratory Control Samples

- ✓ Detector Identification
- ✓ Date of Analysis
- ✓ Calculation of Recoveries
- ✓ Results of Analyses

9713515.0634

TMA
Thermo Analytical Inc.

TMA/Norcal
2030 Wright Avenue
P. O. Box 4040
Richmond, CA 94804-0040
(510) 235-2633 Fax No. (510) 235-0438

JUL 1992
RECEIVED
OSM DMO

July 13, 1992

SENT BY FEDERAL EXPRESS

Ref. TMA/Norcal N1-12-028-9573

Mr. John Bourgeault
Westinghouse Hanford Company
2355 Stevens Drive
Richland, WA 99352

Dear Mr. Bourgeault:

Enclosed on Attachment 1, are the gross alpha, gross beta, ^{3}H, ^{90}Sr, ^{99}Tc, ^{129}I, isotopic uranium, isotopic plutonium, and gamma scan results for the water samples from 300-FF-5 Location, we received 5 December 1991.

Please call if you have any questions concerning this data.

Sincerely,

D.P. Kharkar

Dinkar P. Kharkar, Ph.D.
Manager, Nuclear Programs

Enclosures: Sections 1 through 14
Appendices

INDEX OF DOCUMENTS

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SECTION 2	Case Narrative
SECTION 3	QC Summary
SECTION 4	Chains-of-Custody Copies
SECTION 5	Analytical Methods Used
SECTION 6	Aliquot Information
SECTION 7	Raw Data for Gross Alpha and Gross Beta with QC Summary
SECTION 8	Raw Data for ^{3}H
SECTION 9	Raw Data for ^{90}Sr
SECTION 10	Raw Data for ^{99}Tc
SECTION 11	Raw Data for ^{129}I
SECTION 12	Raw Data for Isotopic Uranium
SECTION 13	Raw Data for Isotopic Plutonium
SECTION 14	Raw Data for Gamma Scan

SEE NEXT PAGE FOR APPENDICES TO BE INCLUDED IN THE DATA PACKAGE

INDEX OF APPENDICES TO BE INCLUDED IN DATA PACKAGE

9573

X	Appendix 1 :	Tritium Standard Solution Certificate and Preparation Information.
X	Appendix 2 :	Isotopic Uranium Standard Solution Certificates and Preparation Information.
X	Appendix 4 :	Preparation Log For QC Samples.
X	Appendix 5 :	Am Standard Solution Certificate and Preparation Information.
X	Appendix 6 :	^{99}Tc Standard Solution Certificate and Preparation Information.
X	Appendix 7 :	^{90}Sr Stock Solution Certificate, Preparation and Dilutions Information.
X	Appendix 8 :	Yttrium Carrier Certificate, Preparation and Dilutions Information.
X	Appendix 10 :	Gamma Scan Spike.
X	Appendix 11 :	Pu Standard Solution Certificate and Preparation Information.
X	Appendix 12 :	Continuing Calibration Data for Tritium for LSC Counters 4 and 5.
X	Appendix 13 :	I Carrier Solution Certificate and Preparation Information.
X	Appendix 15 :	Raw Data for Continuing Calibration for Beta Counters.
X	Appendix 16 :	Primary Calibration References.

9713515.0637

SECTION 1 Data Report

SECTION 2: CASE NARRATIVE

CASE NARRATIVE

1. Project 300-FF-5 water samples (TMA/Norcal Group Nos. 9573, 7003, and 9576) were processed together and the results of the analyses are reported. The sample ID's are:

Customer Sample ID	TMA/Norcal Group No.	Customer Sample ID	TMA/Norcal Group No.
B01DH7	9573-1	B01DL1	7003-6
B01DJ0	9573-2	B01F07	7003-7
B01DJ3	9573-3	B01DM9	7003-8
B01DL7	9573-4	B01DN5	7003-9
B01DN8	9573-5	B01DM6	9576-1
B01DY5	9573-6	B01DP1	9576-2
B01DY7	9573-7	B01DP4	9576-3
B01DY9	9573-8	B01DS8	9576-4
B01DZ1	9573-9	B01DZ3	9576-5
B01DT7	7003-1	B01DT1	9576-6
B01DW6	7003-2	B01DT4	9576-7
B01DX0	7003-3	B01DX3	9576-8
B01DX9	7003-4	B01DZ9	9576-9
B01F15	7003-5	B01F01	9576-10
		B01F03	9576-11
		B01DK8	9576-12

2. The analysis reported are:

WATER

Analyte Sample #	Group # & Sample #	Group # & Sample #	Group # & Sample #
Gross α & β	9573-1-9	7003-1-9	9576-1-12
^{3}H	9573-1,2,3,4, & 5	7003-1,2,3,4,6,8, & 9	9576-1 thru 9, & 11
^{90}Sr	9573-2,3,4,5,6,7,8,&9	7003-1-9	9576-1-12
^{99}Tc	9573-2,3, 4, & 5	7003-1,2,3,4,6,8, & 9	9576-1 thru 9, & 11
^{129}I	9573-2,3, 4, & 5	7003-1,2,3,4,6,8, & 9	9576-1 thru 9, & 11
Isotopic U	9573-1-9	7003-1-9	9576-1-12
Isotopic Pu	9573-2,3, 4, & 5	7003-1,3,4,6,8, & 9	9576-1 thru 9, & 11
^{241}Pu	9573-2,3, 4, & 5	7003-1,3,4,6,8, & 9	9576-1 thru 9, & 11
Gamma Scan	9573-1-9	7003-1-9	9576-1-12

3. Results are reported pCi/L with 2 σ errors.

4. The QC samples consisting of a spike, a laboratory control sample, and a replicate were processed with each batch as shown on Table 1.

SECTION 3: QC SUMMARY

QUALITY CONTROL SUMMARY

Attachments 2, 3, and 4 gives the results of the QC samples. The recovery ratios were determined by the QC Officer based upon the final data obtained for each. The laboratory control samples were calculated with an aliquot of 1.00 and, therefore, the presented data cannot be compared directly with the sample data. To compare them directly, the laboratory control sample data would need to be divided by sample aliquots.

The results of the spike, laboratory control sample, and the replicate for gross alpha, gross beta, ^{3}H, ^{90}Sr, ^{99}Tc, ^{129}I, isotopic Pu, isotopic uranium, and gamma scan were satisfactory. The found/added ratio for gross alpha spikes were 0.76 ± 0.08 and 0.78 ± 0.05. The found/added ratio for ^{234}U and ^{238}U of the second spike were 0.69 ± 0.06 and 0.67 ± 0.06, respectively.

D. P. Kharkar

Dinkar P. Kharkar, Ph.D.
TMA/Norcal Program Manager

TABLE 1

Preparation Batch Samples Processed	Data Package
9573-1 through 9	- WATER
7003-1 through 9	- WATER
9576-1 through 12	- WATER

OC SAMPLES PROCESSED:

Sample I.D.	Type	Analyses	Reported with Data Package
9573-34 (QC 7514)	Spike	Gross α,β	X
9573-35 (QC 7515)	Spike	Gross α,β	X
7003-16 (QC 7544)	Spike	Gross α,β	X
9573-36 (QC 7516)	LCS	Gross α,β	X
9573-37 (QC 7517)	LCS	Gross α,β	X
7003-17 (QC 7545)	LCS	Gross α,β	X
9573-38 (QC 7518)	Replicate	Gross α,β	X
9573-39 (QC 7519)	Replicate	Gross α,β	X
7003-18 (QC 7546)	Replicate	Gross α,β	X
9573-52 (QC 7532)	Spike	^{3}H	X
9573-53 (QC 7533)	Spike	^{3}H	X
9573-54 (QC 7534)	LCS	^{3}H	X
9573-55 (QC 7535)	LCS	^{3}H	X
9573-56 (QC 7536)	Replicate	^{3}H	X
9573-57 (QC 7537)	Replicate	^{3}H	X
9573-10 (QC 7508)	Spike	^{90}Sr	X
9573-11 (QC 7509)	Spike	^{90}Sr	X
7003-13 (QC 7541)	Spike	^{90}Sr	X
9573-12 (QC 7492)	LCS	^{90}Sr	X
9574-13 (QC 7493)	LCS	^{90}Sr	X
7003-14 (QC 7542)	LCS	^{90}Sr	X
9573-14 (QC 7494)	Replicate	^{90}Sr	X
9573-15 (QC 7495)	Replicate	^{90}Sr	X
7003-15 (QC 7543)	Replicate	^{90}Sr	X
9573-22 (QC 7502)	Spike	^{99}Tc	X
9573-23 (QC 7503)	Spike	^{99}Tc	X
9573-24 (QC 7504)	LCS	^{99}Tc	X
9573-25 (QC 7505)	LCS	^{99}Tc	X
9573-26 (QC 7506)	Replicate	^{99}Tc	X
9573-27 (QC 7507)	Replicate	^{99}Tc	X
9573-40 (QC 7520)	Spike	^{129}I	X
9573-41 (QC 7521)	Spike	^{129}I	X
9573-42 (QC 7522)	LCS	^{129}I	X
9573-43 (QC 7523)	LCS	^{129}I	X
9573-44 (QC 7524)	Replicate	^{129}I	X
9573-45 (QC 7525)	Replicate	^{129}I	X

QC SAMPLES PROCESSED: (cont'd.)

Sample I.D.	Type	Analyses	Reported with Data Package
9573-16 (QC 7496)	Spike	Isotopic U	X
9573-17 (QC 7497)	Spike	Isotopic U	X
7003-10 (QC 7538)	Spike	Isotopic U	X
9573-18 (QC 7498)	LCS	Isotopic U	X
9573-19 (QC 7499)	LCS	Isotopic U	X
7003-11 (QC 7539)	LCS	Isotopic U	X
9573-21 (QC 7501)	Replicate	Isotopic U	X
7003-12 (QC 7540)	Replicate	Isotopic U	X
9573-10 (QC 7490)	Spike	Isotopic Pu	X
9573-11 (QC 7491)	Spike	Isotopic Pu	X
9573-58 (QC 7667)	Spike	Isotopic Pu	X
9573-12 (QC 7492)	LCS	Isotopic Pu	X
9573-59 (QC 7668)	LCS	Isotopic Pu	X
9573-14 (QC 7494)	Replicate	Isotopic Pu	X
9573-15 (QC 7495)	Replicate	Isotopic Pu	X
9573-60 (QC 7669)	Replicate	Isotopic Pu	X
9573-46 (QC 7526)	Spike	Gamma Scan	X
9573-47 (QC 7527)	Spike	Gamma Scan	X
7003-19 (QC 7547)	Spike	Gamma Scan	X →
9573-48 (QC 7528)	LCS	Gamma Scan	X
9573-49 (QC 7529)	LCS	Gamma Scan	X
7003-20 (QC 7548)	LCS	Gamma Scan	X →
9573-50 (QC 7530)	Replicate	Gamma Scan	X
9573-51 (QC 7531)	Replicate	Gamma Scan	X
7003-21 (QC 7549)	Replicate	Gamma Scan	X →

missing raw data; data is in 7003

6. Analysis, reanalysis, and reworks, etc.

Gross Alpha and Gross Beta Analyses: The results of the spike, the laboratory control sample were satisfactory, except for gross alpha spikes. The found/added ratio for gross alpha spikes were 0.76 ± 0.08 and 0.78 ± 0.05. No abnormalties were encountered.

Strontium Analyses: The average yield for 29 analyses was 60%. The lowest yield was 25% and the highest was 83%. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered. The spike and the LCS were switched in the Lab and the results of the switched samples were satisfactory.

Isotopic Pu Analyses: The average yield for 20 analyses was 81%. The lowest yield was 34% and the highest was 103%. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Technetium Analyses: The average yield for 21 analyses was 47%. The lowest yield was 14% and the highest was 79%. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Gamma Scan Analyses: The spike sample processed had ^{60}Co and ^{137}Cs activities and the found/added ratio of the spike look good. The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Ttitium Analyses: The results of the spike, the laboratory control sample, and the replicate were satisfactory. No abnormalities were encountered.

Isotopic Uranium Analyses: The average yield for 30 analyses was 61%. The lowest yield was 38% and the highest was 89%. The results of one spike, the laboratory control sample and the replicate were satisfactory. No abnormalities were encountered. The found/added ratio for ^{234}U and ^{238}U of the second spike were 0.69 ± 0.06 and 0.67 ± 0.06.

Iodine-129 Analyses: The average yield for 21 analyses was 62%. The lowest yield was 40% and the highest was 72%. The results of the spike, the laboratory control sample, and the replicate were satisfactory.

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TMA

ATTACHMENT 2 QUALITY CONTROL SAMPLE RESULTS, SPIKES AND BLANKS

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ
Spikes:				
9573-34				
QC-7514	Gross Alpha	(15.0 ± 1.33) E+00	(19.84 ± 0.79) E+00	0.76 ± 0.08 J or UJ
	Gross Beta	(18.8 ± 1.00) E+00	(20.37 ± 0.81) E+00	0.92 ± 0.06 ok
9573-35				
QC-7515	Gross Alpha	(15.5 ± 0.947) E+00	(19.84 ± 0.79) E+00	0.78 ± 0.05 J or UJ
	Gross Beta	(14.8 ± 0.659) E+00	(16.29 ± 0.65) E+00	0.91 ± 0.05 ok
7003-16				
QC-7544	Gross Alpha	(20.2 ± 1.53) E+00	(19.84 ± 0.79) E+00	1.02 ± 0.09 ok
	Gross Beta	(18.7 ± 0.992) E+00	(17.92 ± 0.717) E+00	1.04 ± 0.07 ok
9573-52				
QC-7532	^{3}H	(1.26 ± 0.0645) E+02	(1.17 ± 0.0468) E+02	1.07 ± 0.08 ok
9573-53				
QC-7533	^{3}H	(1.07 ± 0.0614) E+02	(0.937 ± 0.0375) E+02	1.15 ± 0.08 ok
9573-10				
QC-~~7508~~ 7490	^{90}Sr	(6.04 ± 0.926) E+00	(5.99 ± 0.239) E+00	1.01 ± 0.16 ok
9573-11				
QC-~~7509~~ 7491	^{90}Sr	(-0.239 ± 0.330) E+00	(5.13 ± 0.205) E+00	-0.047 ± 0.0649* Do not use
7003-13				
QC-7541	^{90}Sr	(5.52 ± 0.361) E+00	(5.98 ± 0.239) E+00	0.92 ± 0.07 ok
9573-22				
QC-7502	^{99}Tc	(4.28 ± 0.353) E+01	(4.08 ± 0.163) E+01	1.05 ± 0.09 ok
9573-23				
QC-7503	^{99}Tc	(4.39 ± 0.259) E+01	(4.59 ± 0.184) E+01	0.96 ± 0.07 ok
9573-40				
QC-7520	^{129}I	(13.8 ± 1.58) E+00	(12.60 ± 0.50) E+00	1.09 ± 0.13 ok
9573-41				In that all results well met, qualifies UJ
QC-7521	^{129}I	(1.80 ± 0.0821) E+01	(1.470 ± 0.0588) E+01	1.22 ± 0.07 R
9573-16				
QC-7496	^{234}U	(3.74 ± 0.314) E+00	(5.43 ± 0.217) E+00	0.69 ± 0.06 J or UJ
	^{235}U	(2.59 ± 0.705) E-01	(2.59 ± 0.705) E-01	1.04 ± 0.29 ok
	^{238}U	(3.66 ± 0.305) E+00	(5.43 ± 0.217) E+00	0.67 ± 0.06 J or UJ
9573-17				
QC-7497	^{234}U	(4.07 ± 0.351) E+00	(4.34 ± 0.174) E+00	0.94 ± 0.08 ok
	^{235}U	(2.52 ± 0.695) E-01	(1.99 ± 0.159) E-01	1.27 ± 0.37 R
	^{238}U	(4.18 ± 0.356) E+00	(4.34 ± 0.174) E+00	0.96 ± 0.09 ok
7003-10				
QC-7538	^{234}U	(4.77 ± 0.395) E+00	(4.78 ± 0.191) E+00	1.00 ± 0.09 ok
	^{235}U	(0.203 ± 0.0686) E+00	(0.219 ± 0.018) E+00	0.93 ± 0.32 ok
	^{238}U	(4.86 ± 0.399) E+00	(4.78 ± 0.191) E+00	1.02 ± 0.09 ok

1. All checked against MDAs - All greater than MDA except Pu^{241} - no info. to compare.
2. Meets criteria of at least one per SDG

ATTACHMENT 2 QUALITY CONTROL SAMPLE RESULTS, SPIKES AND BLANKS (cont'd, page two)

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found	Added	Recovery Ratio Found/Added ± 2 σ	
9573-10					
QC-7490	^{238}Pu	(3.22 ± 0.280) E+00	(3.31 ± 0.17) E+00	0.98 ± 0.10	ok
	^{239}Pu	(2.55 ± 0.234) E+00	(2.70 ± 0.11) E+00	0.94 ± 0.09	
	^{241}Pu	(5.83 ± 0.606) E+01	(6.19 ± 0.247) E+01	0.94 ± 0.10	
9573-11					
QC-7491	^{238}Pu	(2.76 ± 0.220) E+00	(2.65 ± 0.106) E+00	1.05 ± 0.09	ok
	^{239}Pu	(2.71 ± 0.215) E+00	(2.70 ± 0.11) E+00	1.00 ± 0.09	
	^{241}Pu	(6.62 ± 0.595) E+01	(6.19 ± 0.247) E+00	1.07 ± 0.11	
9573-58					
QC-7667	^{238}Pu	(3.28 ± 0.187) E+00	(3.31 ± 0.132) E+00	0.99 ± 0.07	ok
	^{239}Pu	(3.11 ± 0.180) E+00	(3.24 ± 0.130) E+00	0.96 ± 0.07	
	^{241}Pu	(6.67 ± 0.440) E+01	(6.19 ± 0.247) E+01	1.08 ± 0.09	
9573-46					
QC-7526	Gamma Scan:				
	^{60}Co	(6.249 ± 0.894) E+01	(6.719 ± 0.269) E+01	0.93 ± 0.14	ok
	^{137}Cs	(6.447 ± 0.767) E+01	(6.273 ± 0.251) E+01	1.03 ± 0.13	
9573-47					
QC-7527	Gamma Scan:				
	^{60}Co	(3.846 ± 1.110) E+01	(5.375 ± 0.215) E+01	0.72 ± 0.21	5 or 5
	^{137}Cs	(6.604 ± 0.921) E+01	(6.272 ± 0.251) E+01	1.05 ± 0.15	ok
7003-19					
QC-7547	Gamma Scan:				
	^{60}Co	(4.883 ± 0.761) E+01	(5.387 ± 0.215) E+01	0.91 ± 0.14	ok
	^{137}Cs	(8.269 ± 0.730) E+01	(8.364 ± 0.335) E+01	0.99 ± 0.10	

OK

* Samples 9573-11 and 9573-13 for ^{90}Sr were switched in the lab.

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ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, LABORATORY CONTROL SAMPLES

TMA

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found		Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples:				Blanks	
9573-36					
QC-7516	Gross Alpha	(-0.045 ± 0.23)	E+00	0	Satisfactory ok
	Gross Beta	(-0.00670 ± 0.333)	E+00	0	Satisfactory ok
9573-37					
QC-7517	Gross Alpha	(-0.0606 ± 0.154)	E+00	0	Satisfactory ok
	Gross Beta	(0.0500 ± 0.251)	E+00	0	Satisfactory ok
7003-17					
QC-7545	Gross Alpha	(0.0310 ± 0.214)	E+00	0	Satisfactory ok
	Gross Beta	(-1.180 ± 0.407)	E+00	0	Satisfactory ok
9573-54					
QC-7534	^{3}H	(-0.790 ± 2.31)	E+00	0	Satisfactory ok
9573-55					
QC-7535	^{3}H	(1.09 ± 2.50)	E+00	0	Satisfactory ok
9573-12					
QC-7492	^{90}Sr	(-0.930 ± 1.76)	E+00	0	Satisfactory ok
9573-13					
QC-7493	^{90}Sr	(4.46 ± 1.41)	E+00	0	Satisfactory* Do not use
7003-14					
QC-7542	^{90}Sr	(-0.0480 ± 0.166)	E+00	0	Satisfactory ok
9573-24					
QC-7504	^{99}Tc	(0.318 ± 0.738)	E+00	0	Satisfactory ok
9573-25					
QC-7505	^{99}Tc	(2.10 ± 0.879)	E+00	0	Satisfactory ok
9573-42					
QC-7522	^{129}I	(0.817 ± 1.37)	E+00	0	Satisfactory ok
9573-43					
QC-7523	^{129}I	(-0.438 ± 1.01)	E+00	0	Satisfactory ok
9573-18					
QC-7498	^{234}U	(-0.676 ± 0.406)	E-02	0	Satisfactory ok
	^{235}U	(0.818 ± 1.64)	E-02	0	Satisfactory ok
	^{238}U	(2.70 ± 4.06)	E-02	0	Satisfactory ok
9573-19					
QC-7499	^{234}U	(1.24 ± 3.31)	E-02	0	Satisfactory ok
	^{235}U	(0 ± 2.01)	E-02	0	Satisfactory ok
	^{238}U	(2.49 ± 2.49)	E-02	0	Satisfactory ok
7003-11					
QC-7539	^{234}U	(-0.0137 ± 0.0137)	E+00	0	Satisfactory ok
	^{235}U	(0.0125 ± 0.0166)	E+00	0	Satisfactory ok
	^{238}U	(0.00686 ± 0.0137)	E-00	0	Satisfactory ok

* Samples 9573-11 and 9573-13 for ^{90}Sr were switched in the lab.
meets criteria of at least one/SDG

ATTACHMENT 3 QUALITY CONTROL SAMPLE RESULTS, LABORATORY CONTROL SAMPLES (cont'd, page 2)

TMA/Norcal Group No.	Nuclide	pCi/Sample ± Error 2 σ Found		Added	Recovery Ratio Found/Added ± 2 σ
Laboratory Control Samples:					
9573-12					
QC-7492	^{238}Pu	(1.45 ± 4.85)	E-02	0	Satisfactory > ~~Bias~~ ok
	^{239}Pu	(-0.970 ± 2.91)	E-02	0	Satisfactory ok
	^{241}Pu	(0.650 ± 1.95)	E+00	0	Satisfactory ok
9573-59					
QC-7668	^{238}Pu	(-1.17 ± 2.35)	E-03	0	Satisfactory ok
	^{239}Pu	(0 ± 2.35)	E-03	0	Satisfactory ok
	^{241}Pu	(0.0568 ± 0.0024)	E+00	0	Satisfactory ok
9573-48					
QC-7528	Gamma Scan:				
	^{40}K	<1.191	E+02	0	Satisfactory
	^{51}Cr	<3.887	E+01	0	Satisfactory
	^{60}Co	<7.958	E+00	0	Satisfactory ok
	^{65}Zn	<1.306	E+01	0	Satisfactory
	^{134}Cs	<6.271	E+00	0	Satisfactory
	^{137}Cs	<7.343	E+00	0	Satisfactory ok
	^{226}Ra	<1.291	E+01	0	Satisfactory
	^{228}Th	<1.522	E+01	0	Satisfactory ok
	^{232}Th	<3.194	E+01	0	Satisfactory
9573-49					
QC-7529	Gamma Scan:				
	^{40}K	<5.305	E+01	0	Satisfactory
	^{51}Cr	<3.209	E+01	0	Satisfactory
	^{60}Co	<7.299	E+00	0	Satisfactory ok
	^{65}Zn	<1.027	E+01	0	Satisfactory
	^{134}Cs	<5.411	E+00	0	Satisfactory
	^{137}Cs	<5.427	E+00	0	Satisfactory ok
	^{226}Ra	<9.716	E+00	0	Satisfactory
	^{228}Th	<8.304	E+00	0	Satisfactory ok
	^{232}Th	<2.511	E+01	0	Satisfactory
7003-20					
QC-7548	Gamma Scan:				
	^{40}K	<8.367	E+01	0	Satisfactory
	^{51}Cr	<2.871	E+01	0	Satisfactory
	^{60}Co	<5.273	E+00	0	Satisfactory ok
	^{65}Zn	<8.546	E+00	0	Satisfactory
	^{134}Cs	<4.958	E+00	0	Satisfactory
	^{137}Cs	<4.803	E+00	0	Satisfactory ok
	^{226}Ra	<8.815	E+00	0	Satisfactory
	^{228}Th	<7.158	E+00	0	Satisfactory ok
	^{232}Th	<1.996	E+00	0	Satisfactory

Conservatively ok

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES

Nuclide	Results pCi/L ± error 2 σ	
	No. 9573-38 Replicate	No. 9573-2 Original
QC 7518		
Gross Alpha	(-0.400 ± 1.43) E+00	(-0.0710 ± 1.12) E+00
Gross Beta	(4.42 ± 1.37) E+00	(3.83 ± 1.56) E+00
	No. 9573-39 Replicate	No. 9573-3 Original
QC 7519		
Gross Alpha	(-0.277 ± 0.992) E+00	(-0.520 ± 2.09) E+00
Gross Beta	(4.17 ± 1.15) E+00	(6.02 ± 1.48) E+00
	No. 7003-18 Replicate	No. 7003-5 Original
QC 7546		
Gross Alpha	(13.3 ± 2.98) E+00	(6.85 ± 3.04) E+00
Gross Beta	(18.1 ± 2.02) E+00	(12.1 ± 1.77) E+00
	No. 9573-56 Replicate	No. 9573-2 Original
QC 7536		
^{3}H	(-1.14 ± 1.15) E+02	(0.355 ± 1.22) E+02
	No. 9573-57 Replicate	No. 9573-3 Original
QC 7537		
^{3}H	(0.199 ± 1.34) E+02	(-0.279 ± 1.14) E+02
	No. 9573-14 Replicate	No. 9573-2 Original
QC 7494		
^{90}Sr	(-0.0407 ± 0.172) E+00	(0.0316 ± 1.65) E+00
	No. 9573-15 Replicate	No. 9573-3 Original
QC 7495		
^{90}Sr	(-0.154 ± 0.454) E+00	(0.0 ± 1.46) E+00
	No. 7003-15 Replicate	No. 7003-5 Original
QC 7543		
^{90}Sr	(0.272 ± 0.357) E+00	(0.190 ± 1.62) E+00
	No. 9573-26 Replicate	No. 9573-2 Original
QC 7506		
^{99}Tc	(1.65 ± 1.90) E+00	(9.96 ± 5.20) E+00
	No. 9573-27 Replicate	No. 9573-3 Original
QC 7507		
^{99}Tc	(-0.603 ± 2.96) E+00	(2.83 ± 2.77) E+00

Comments on separate sheet

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES (cont'd, page two)

Nuclide	Results pCi/L ± error 2 σ	
	No. 9573-44 Replicate	No. 9573-2 Original
QC 7524		
^{129}I	(0.110 ± 3.35) E+00	(1.43 ± 2.63) E+00
	No. 9573-45 Replicate	No. 9573-3 Original
QC 7525		
^{129}I	(2.52 ± 2.33) E+00	(0.732 ± 3.08) E+00
	No. 9573-21 Replicate	No. 9573-3 Original
QC 7501		
^{234}U	(6.78 ± 1.08) E-01	(5.86 ± 3.71) E-02
^{235}U	(5.68 ± 3.51) E-02	(-0.746 ± 1.49) E-02
^{238}U	(6.85 ± 1.08) E-01	(5.86 ± 3.10) E-02
	No. 7003-12 Replicate	No. 7003-5 Original
QC 7540		
^{234}U	(8.90 ± 0.714) E+00	(6.75 ± 0.458) E+00
^{235}U	(7.93 ± 1.50) E-01	(6.82 ± 1.05) E-01
^{238}U	(8.55 ± 0.690) E+00	(5.96 ± 0.417) E+00
	No. 9573-14 Replicate	No. 9573-2 Original
QC 7494		
^{238}Pu	(-1.91 ± 7.63) E-03	(1.82 ± 7.28) E-03
^{239}Pu	(3.80 ± 7.61) E-03	(0 ± 3.63) E-03
^{241}Pu	(-2.08 ± 5.90) E+00	(-1.40 ± 0.0287) E+00
	No. 9573-15 Replicate	No. 9573-3 Original
QC 7495		
^{238}Pu	(-1.04 ± 6.25) E-02	(2.22 ± 8.86) E-03
^{239}Pu	(-3.11 ± 4.17) E-02	(2.21 ± 8.83) E-03
^{241}Pu	(-13.94 ± 33.59) E+00	(0.163 ± 0.652) E+00
	No. 9573-60 Replicate	No. 9573-4 Original
QC 7669		
^{238}Pu	(1.15 ± 4.59) E-03	(-2.41 ± 9.64) E-03
^{239}Pu	(2.29 ± 4.58) E-03	(2.40 ± 4.80) E-03
^{241}Pu	(-1.45 ± 2.89) E+00	(0.387 ± 0.774) E+00

ATTACHMENT 4 QUALITY CONTROL RESULTS, REPLICATES (cont'd, page three)

Nuclide	Results pCi/L ± error 2 σ			
	No. 9573-50 Replicate		No. 9573-2 Original	
QC-7530				
Gamma Scan:				
^{40}K	<2.309	E+02	<2.016	E+02
^{51}Cr	<7.084	E+03	<7.086	E+03
^{60}Co	<1.608	E+01	<1.787	E+01
^{65}Zn	<4.054	E+01	<5.339	E+01
^{134}Cs	<1.541	E+01	<1.689	E+01
^{137}Cs	<1.451	E+01	<1.500	E+01
^{226}Ra	<2.141	E+01	<2.880	E+01
^{228}Th	<2.139	E+01	<2.432	E+01
^{232}Th	<5.004	E+01	<5.446	E+01
	No. 9573-51 Replicate		No. 9573-3 Original	
QC-7531				
Gamma Scan:				
^{40}K	<1.067	E+02	<2.304	E+02
^{51}Cr	<6.563	E+03	<6.769	E+03
^{60}Co	<1.654	E+01	<1.230	E+01
^{65}Zn	<3.956	E+01	<4.039	E+01
^{134}Cs	<1.371	E+01	<1.399	E+01
^{137}Cs	<9.731	E+00	<1.310	E+01
^{226}Ra	<2.889	E+01	<2.315	E+01
^{228}Th	<3.459	E+01	<2.289	E+01
^{232}Th	<5.045	E+01	<5.239	E+01
	No. 7003-21 Replicate		No. 7003-5 Original	
QC-7549				
Gamma Scan:				
^{40}K	<1.506	E+02	<1.209	E+02
^{51}Cr	<5.374	E+03	<4.725	E+03
^{60}Co	<1.946	E+01	<1.679	E+01
^{65}Zn	<4.325	E+01	<3.243	E+01
^{134}Cs	<1.136	E+01	<1.334	E+01
^{137}Cs	<1.080	E+01	<1.148	E+01
^{226}Ra	<2.281	E+01	<2.199	E+01
^{228}Th	<2.387	E+01	<1.814	E+01
^{232}Th	<4.614	E+01	<3.989	E+01

NOTES TO QC RESULTS

(1) Sample 9573-13 is an aliquot of 7014-1, however, for QC batching convenience it was given group 9573 designation.

(2) Sample 9573-10 is an aliquot of 7006-1, however, for QC batching convenience it was given group 9573 designation.

(3) Sample 9573-16 is an aliquot of 9562-2, however, for QC batching convenience it was given group 9573 designation.

SECTION 4: COPIES OF CHAINS-OF-CUSTODY

9713515.0654

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-2-91

Ice Chest No. FIFE

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. ~~247425882-4~~ 247425882-5 PHB 12/4/91

Offsite Property No. W92- 0-0035-49

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PHB 12/3/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DH7

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DH8

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
LD Walker L.D. Walker	PHButcher PHButcher	12/3/91 0700
PHButcher PHButcher	Kermit Blum	12-5-91 1130

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 9713516.0655

SAMPLE ANALYSIS REQUEST

TASK # 91-097

PART I: FIELD SECTION

Collector LD WALKER/KD LEE Date Sampled _____ Time _____ hours

Company Contact PH BUTCHER Telephone (509) ~~376-0165~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01DH7	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRTIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129
			Tc-99, U-ISOTOPIC (HNO3)
B01DH8	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
	3, 40ml, Ag	W	CLP-VOA

Field Information** BOL#: ~~2474852814~~ PHG 1314 91 2474253825 OPC#: W92-0-0035 #49

Special Handling and/or Storage N/A

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0656

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/2/91

Ice Chest No. #10

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 2474285282-5 ~~5474285544~~ PHB 12/4/91

Offsite Property No. W92- 0-0035-48

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PHB 12/7/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DJ0

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DJ1

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: L.D. Walker, L.D. Walker	Received by: P H Butcher P H Butcher	Date/Time: 12/3/91 0700
Relinquished by: P H Butcher P H Butcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 9713515.0657

SAMPLE ANALYSIS REQUEST

TASK # 91-097

PART I: FIELD SECTION

ollr r LD WALKER/KD LEE Date Sampled 12/8/91 Time 1245 hours

ompany Contact PH BUTCHER Telephone (509) ~~376-6165~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
301DJ0	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRITIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129,
			Tc-99, U-ISOTOPIC (HNO3)
B01DJ1	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
	3, 40ml, Ag	W	CLP-VOA

eld Information** BOL#: ~~PHS 247485414~~ OPC#: W97-0-0035-48
247425282-5 PHS 12/4/91

ecial Handling and/or Storage N/A

ossible Sample Hazards

PART II: LABORATORY SECTION

ec d by Kermit Blum Title Sample Control Supervisor Date 12-5-91

nalysis Required

*Indicate whether sample is soil, sludge, water, etc.
**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0658

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/2/91

Ice Chest No. SMC-16

Field Logbook No. EFL-1004 Pg. 1

Bill of Lading/Airbill No. ~~2474959814~~ 2474852222-5 PHB 12/4/91

Offsite Property No. W92-0-0035-48

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PHB 12/7/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DJ3

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DJ4

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

B01F60 3, 40ml, G, WATER, CLP-VOA

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: Kirby D. Lee Kirby Lee	Received by: PHButcher PHButcher	Date/Time: 12/3/91 12/2/91 0700
Relinquished by: PHButcher PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 9713519.0659

SAMPLE ANALYSIS REQUEST

TASK # 91-097

PART I: FIELD SECTION

Collector LD WALKER/KD LEE Date Sampled 12/9/91 Time 0948 hours

Company Contact PH BUTCHER Telephone (509) ~~376-6165~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
301DJ3	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRTIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129
			TC-99, U-ISOTOPIC (HNO3)
301DJ4	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
301F60	3, 40ml, Ag	W	CLP-VOA

Field Information** BOL#: W92-0-0035-48 OPC#: ~~{24-4553814~~ 2474253282-5 PTB 12/9/91

Special Handling and/or Storage N/A

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0660

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-3-91

Ice Chest No. De49-2

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 2474252885

Offsite Property No. W92-0-0035-52

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA PHB 12/4/91

Possible Sample Hazards/Remarks N/A

Sample Identification

BO 1D27

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

BO 1D28

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
L.D. Walker	PHButcher	12/4/91 0800
PHButcher	Kermit Blum	12-5-91 1130

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 9715516.0661

SAMPLE ANALYSIS REQUEST

TASK # 91-097

PART I: FIELD SECTION

Collector LD WALKER/KD LEE Date Sampled 12/3/91 Time 1145 hours

Company Contact PH BUTCHER Telephone (509) ~~376-6165~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
B01DL7	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRTIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, Co-60, Cs-137, I-129
			Tc-99, U-ISOTOPIC (HNO3)
B01DL8	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
	3, 40ml, Ag	W	CLP-VOA

Field Information** BOL#: 247485282-5 OPC#: W92-0-0035-52

Special Handling and/or Storage N/A

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0662

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/3/91

Ice Chest No. #64

Field Logbook No.

Bill of Lading/Airbill No. 247425282-5

Offsite Property No. W92- 0-0035-52

Method of Shipment EMERY

Shipped to ~~WESTON~~ TMA 12/3/91

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DN8

1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
1, 2L, aG, WATER, CLP-SEMI-VOA, PEST/PCB's
1, 1L, P, WATER, CLP-CN (NaOH)
1, 500ml, P, WATER, ANIONS(IC) (ZnAC+NaOH)
1, 500ml, P, WATER, AMMONIA, COD (H2SO4)
1, 1L, P, WATER, BOD (H2SO4)
1, 1L, P, WATER, TDS, DISSOLVED OXYGEN, TSS, pH, ALK
1, 250ml, P, HARDNESS
1, 250ml, Gs, WATER, TOX (H2SO4)
1, 250ml, aG, WATER, TOC (H2SO4)
1, 250ml, Gs, WATER, TRITIUM
1, 10L, P, WATER, GROSS ALPHA/BETA, GAMMA SCAN, Sr-90, Pu-238/239, Pu-241, Co-60, Cs-137, I-129, Tc-99, U-ISOTOPIC (HNO3)

B01DN9
~~B01DN8~~
PHB 12/2/91 1, 1L, P, WATER, ICP/AA METALS & Hg (HNO3) FILTERED

B01F61, 3, 40ml, G, water, CLP-VOA

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: Kirby A. Lee K.D. Lee	Received by: PHButcher PHButcher	Date/Time: 12/4/91 0800 12/3/91 1500
Relinquished by: PHButcher PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company

9713515.0663

SAMPLE ANALYSIS REQUEST

TASK # 91-097

PART I: FIELD SECTION

oll or LD WALKER/KD LEE Date Sampled 12/3/91 Time 0807 hours

ompany Contact PH BUTCHER Telephone (509) ~~376-6165~~ 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
301DN8	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) UNFILTERED
	3, 40ml, aG	W	CLP-VOA
	1, 2L,aG	W	CLP-SEMI-VOA, PEST/PCB's
	1, 1L, P	W	CLP CN (NaOH)
	1,500ml,P	W	ANIONS(IC) (ZnAC+NaOH)
	1,500ml, P	W	AMMONIA, COD (H2SO4)
	1, 1L, P	W	BOD (H2SO4)
	1 1L, P	W	TDS, DISSOLVED OXYGEN TSS, pH, ALK
	1, 250ml,P	W	HARDNESS
	1, 250ml,Gs	W	TOX (H2SO4)
	1, 250ml,aG	W	TOC (H2SO4)
	1, 250ml Gs	W	TRITIUM
	1, 10 L, P	W	GROSS ALPHA/BETA, GAMMA SCAN, Sr-90,
			Pu-238/239, Pu-241, (Co-60, Cs-137), I-129
			Tc-99, U-ISOTOPIC (HNO3)
301DN9	1, 1L, P	W	ICP/AA METALS & Hg (HNO3) FILTERED
301F61	3, 40ml, Ag	W	CLP-VOA

eld Information** BOL#: 247495282-5 OPC#: W92-0-0035-52

pecial Handling and/or Storage N/A

ossible Sample Hazards

PART II: LABORATORY SECTION

ec d by Kermit Blum Title Sample Control Supervisor Date 12-5-91

nalysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406 (05/90)

9713515.0664

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/3/91

Ice Chest No. Happy

Field Logbook No. EFL-1066 pg 2

Bill of Lading/Airbill No. 8474852882-5

Offsite Property No. W92- 0-0035-50

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DY5

- 1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
- 3, 40ml, aG, WATER, CLP-VOA
- LW 12-3-91 1 - ~~3,~~ 1L, aG, WATER, CLP-PEST/PCB's
- 1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
- 1, 250ml, P, WATER, AMMONIA (H2SO4)
- 1, 125ml, P, WATER, pH
- 2, 4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238, Co-60, Cs-137 (HNO3) LW 12-3-91

B01DY6

- 1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: Kirby P. Lee K.D. Lee	Received by: PHButcher PHButcher	Date/Time: 12/4/91 0800 12/3/91 1510
Relinquished by: PHButcher PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 9713515.0665

SAMPLE ANALYSIS REQUEST

Task #: 91-097

PART I: FIELD SECTION

Collector: KD Lee / LD Walker Date Sampled: 12/3/91 Time: 1047 hours

Company Contact: ~~R. H. Ford~~ PH Butcher Telephone: (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~BCO~~ BOLDY5	1, 1L, P	W	ICP/AA Metals (HNO_3) Unfiltered
~~BCO~~	3, 40ml aG	W	CLP VOA
	1, 1L, aG	W	CLP. Pest/ PCB
	1, 500ml P	W	Anions (F, NO_2, NO_3) ($ZnAC+NaOH$)
	1, 1250ml, P	W	Ammonia (H_2SO_4)
	1, 125ml, P	W	pH
	2, 4L P	W	Gross Alpha/Beta, Sr-90, Pu-239, Pu-238, Co-60, Cs-137 (HNO_3)
BOLDY6	1, 1L, P	W	ICP/AA Metals (HNO_3) Filtered

Field Information**: BOL # 247425282-5 DPC # W92-0-0035-50

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by: Kermit Blum Title: Sample Control Supervisor Date: 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

A 5000 ANE memo

9213515.0666

Westinghouse Hanford Company

CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-3-91

Ice Chest No. 5ML-31

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 2474258805

Offsite Property No. W92-0-0035-50

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DY7

1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
LW 12-3-91 1 ~~3,~~ 1L, aG, WATER, CLP-PEST/PCB's
1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
1, 250ml, P, WATER, AMMONIA (H2SO4)
1, 125ml, P, WATER, pH
LW 12-3-91 2,4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238, Co-60, Cs-137 (HNO3)

B01DY8

1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: LD Walker L.D. Walker	Received by: PH Butcher PH Butcher	Date/Time: 12/4/91 0800
Relinquished by: PH Butcher PH Butcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

9713515.0667

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST Task # 91-097

PART I: FIELD SECTION

Collector KD Lee / LD Walker Date Sampled 12-3-91 Time 1245 hours

Company Contact ~~R. H. Ford~~ PHKitcher Telephone (509) 376-~~6465~~ 5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~00~~ B01DY7	1, 1L, P	W	ICP/AA Metals (HNO_3) Unfiltered
~~00~~	3, 40ml aG	W	CLP VOA
	1, 1L, aG	W	CLP-Pest/PCB
	1, 500ml, P	W	Anions (F, NO_2, NO_3) ($ZnAC+NaOH$)
	1, 1250ml, P	W	Ammonia (H_2SO_4)
	1, 125ml, P	W	pH
	2, 4L, P	W	Gross Alpha/Beta, Sr-90, Pu-235,
			Pu-238, Co-60, Cs-137 (HNO_3)
B01DY8	1, 1L, P	W	ICP/AA Metals (HNO_3) Filtered

Field Information** BOL # 247425288-5 DPC # W92-0-0035-50

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-5000-406 (05/90)

9713515.0668

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12-3-91

Ice Chest No. SML-34

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 247435282-5

Offsite Property No. W92-0-0035-51

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DY9

1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
LW 12-3-91 1 ~~3~~, 1L, aG, WATER, CLP-PEST/PCB's
1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
1, 250ml, P, WATER, AMMONIA (H2SO4)
1, 125ml, P, WATER, pH
2, 4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238,
LW 12-3-91 Co-60, Cs-137 (HNO3)

B01DZ0

1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: L.D. Walker L.D. Walker	Received by: PH Butcher PH Butcher	Date/Time: 12/4/91 0800
Relinquished by: PH Butcher PH Butcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 9713515.0669

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD Lee / LD Walker Date Sampled 12/3/91 Time 0855 hours

Company Contact ~~B. H. Ford~~ PH Butcher Telephone (509)

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~B00~~ B0/DY9	1, 1L, P	W	ICP/AA Metals (HNO_3) Unfiltered
~~B00~~	3, 40ml aG	W	CLP VOA
	1, 1L, aG	W	CLP. Pest/ PCB
	1, 500ml P	W	Anions (F, NO_2, NO_3) ($ZnAc+NaOH$)
	1, 1250ml, P	W	Ammonia (H_2SO_4)
	1, 125ml, P	W	pH
	2, 4L, P	W	Gross Alpha/Beta, Sr-90, Pu-239, Pu-238, Co-60, Cs-137 (HNO_3)
B0/DZ0	1, 1L, P	W	ICP/AA Metals (HNO_3) Filtered

Field Information** BOL # 247425282-5 DPC # W92-0-0035-51

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

A 5000 405 (08/90)

9713515.0670

Westinghouse Hanford Company	CHAIN OF CUSTODY

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 12/3/91

Ice Chest No. Sneezy-1

Field Logbook No. EFL-1000

Bill of Lading/Airbill No. 2474258825

Offsite Property No. W92-0-0035-51

Method of Shipment EMERY

Shipped to TMA

Possible Sample Hazards/Remarks N/A

Sample Identification

B01DZ1

1, 1L, P, WATER, ICP/AA METALS (HNO3) UNFILTERED
3, 40ml, aG, WATER, CLP-VOA
LW 12-3-91 1 ~~3~~, 1L, aG, WATER, CLP-PEST/PCB's
1, 500ml, P, WATER, ANIONS(F,NO2,NO3) (ZnAC+NaOH)
1, 250ml, P, WATER, AMMONIA (H2SO4)
1, 125ml, P, WATER, pH
2,4L ~~1, 10L~~, P, WATER, GROSS ALPHA/BETA, Sr-90, Pu-235, Pu-238,
LW 12-3-91 Co-60, Cs-137 (HNO3)

B01DZ2

1, 1L, P, WATER, ICP/AA METALS (HNO3) FILTERED

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: K.D. Lee K.D. Lee	Received by: PHButcher PHButcher	Date/Time: 12/4/91 0800 12/3/91
Relinquished by: PHButcher PHButcher	Received by: Kermit Blum	Date/Time: 12-5-91 1130
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

Westinghouse Hanford Company 9135515.0671

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector KD Lee / LD Walker Date Sampled 12/3/91 Time 1405 hours

Company Contact ~~R H Ford~~ PH Butcher Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
~~300~~ B01DZ1	1, 1L, P	W	ICP/AA Metals (HNO_3) Unfiltered
~~300~~	3, 40ml aG	W	CLP VOA
	1, 1L, aG	W	CLP. Pest/ PCB
	1, 500ml P	W	Anions (F, NO_2, NO_3) ($ZnAC + NaOH$)
	1, 1250ml, P	W	Ammonia (H_2SO_4)
	1, 125ml P	W	pH
	2, 4L P	W	Gross Alpha/Beta, Sr-90, Pu-235, Pu-238, Co-60, Cs-137 (HNO_3)
B01DZ2	1, 1L P	W	ICP/AA Metals (HNO_3) Filtered

Field Information** BOL # 2474252882-5 DPC # 6192-0-0035-51

Special Handling and/or Storage

Possible Sample Hazards

PART II: LABORATORY SECTION

Received by Kermit Blum Title Sample Control Supervisor Date 12-5-91

Analysis Required

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location

GAB	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Aliquot (g or l)	0.30000		0.30000		0.30000		0.30000		0.30000		0.30000		0.30000		0.30000		0.30000	
6	Sample Weight (g or l)	0.16570		0.09560		0.15190		0.11060		0.16150		0.07410		0.10310		0.15980		0.10220	
7	Counted Weight (g or l)	0.16570		0.09560		0.15190		0.11060		0.16150		0.07410		0.10310		0.15980		0.10220	
8	[GROSS BETA]																		
9	Gross Counts	244.00000		282.00000		275.00000		982.00000		1054.00000		1097.00000		2033.00000		979.00000		1084.00000	
10	Time (min)	100.00000		100.00000		100.00000		103.00000		103.00000		200.00000		200.00000		200.00000		200.00000	
11	Gross CPM	2.44000		2.82000		2.75000		9.53398		10.23301		5.48500		10.16500		4.89500		5.32000	
12	BKG CPM	2.22900		1.77100		1.14800		1.11700		1.10800		1.89000		1.36900		1.80300		2.63000	
13	Observed CPM	0.21100		1.04900		1.60200		8.41698		9.12501		3.59500		8.79600		3.09200		2.69000	
14	Alpha to Beta Xtalk	0.36400		0.29800		0.35200		0.31300		0.36000		0.27900		0.30500		0.35900		0.30400	
15	Observed Alpha	-0.00100		0.00200		-0.01500		1.70800		0.16800		0.72000		1.29400		0.66400		0.40100	
16	Beta to Alpha Xtalk	0.00600		0.00600		0.00600		0.00600		0.00600		0.00600		0.00600		0.00600		0.00600	
17	True CPM	0.21183	(.7)	0.29600		1.61098		0.80600		9.08415		3.39981		8.41673		2.85978		2.57279	
18	Efficiency (CPM/DPM)	0.40000		0.40000		0.40200		0.40800		0.40000		0.41700		0.40900		0.40000		0.41000	
19	DPM of Aliquot	0.52957		15.74001		4.00667		1.97549		22.71038		8.15302		20.57881		7.14946		6.27509	
20	Reported Results (pCi/g or pCi/l)	0.79400		3.83000		6.02000		29.10000		34.10000		12.20000		30.90000		10.70000		9.43000	
21	Calculated Results (pCi/g or pCi/l)	0.79515	OK	23.63363	*	6.01602	OK	2.99620	*	34.09967	OK	12.24178	OK	30.89911	OK	10.73492	OK	9.42206	OK
22	Reported MDA	2.61000		2.26000		1.87000		1.79000		1.81000		1.63000		1.41000		1.66000		1.96000	
23	Calculated MDA	2.61160	OK	2.32788	OK	1.86490	OK	1.78591	OK	1.81427	OK	1.63114	OK	1.41539	OK	1.65087	OK	1.95700	OK
24	Results > MDA?	NO		YES		YES		YES		YES		YES		YES		YES		YES	
25	[GROSS ALPHA]																		
26	Gross Counts	8.00000		7.00000		11.00000		188.00000		26.00000		162.00000		276.00000		144.00000		90.00000	
27	Time (min)	100.00000		100.00000		100.00000		103.00000		103.00000		200.00000		200.00000		200.00000		200.00000	
28	Gross CPM	0.08000		0.07000		0.11000		1.82524		0.25243		0.81000		1.38000		0.72000		0.45000	
29	BKG CPM	0.08100		0.06800		0.12500		0.11700		0.08500		0.09000		0.08600		0.05600		0.04900	
30	Observed CPM	-0.00100		0.00200		-0.01500		1.70824		0.16743		0.72000		1.29400		0.66400		0.40100	
31	Beta to Alpha Xtalk	0.00600		0.00600		0.00600		0.00600		0.00600		0.00600		0.00600		0.00600		0.00600	
32	True CPM	-0.00227		-0.00430		-0.02486		1.66086		0.11292		0.69960		1.24350		0.64684		0.38556	
33	Efficiency (CPM/DPM)	0.06600		0.09900		0.07000		0.09000		0.06800		0.11900		0.09300		0.06800		0.09400	
34	DPM of Aliquot	-0.03441		-0.04345		-0.35234		18.45400		1.66060		5.87900		13.37096		9.51237		4.10174	
35	Reported Results (pCi/g or pCi/l)	-0.03918		-0.07097		-0.52000		27.80000		2.56000		8.63000		20.00000		14.30000		6.16000	
36	Calculated Results (pCi/g or pCi/l)	-0.05106	*	-0.06524	OK	-0.52906	OK	27.70871	OK	2.49340	OK	8.62733	OK	20.07652	OK	14.28264	OK	6.15478	OK
37	Reported MDA	3.00000		1.84000		3.55000		2.63000		2.97000		1.25000		1.56000		1.73000		1.17000	
38	Calculated MDA	3.01724	OK	1.84302	OK	3.53402	OK	2.62025	OK	2.95593	OK	1.24730	OK	1.56014	OK	1.72190	OK	1.16511	OK
39	Results > MDA?	NO		NO		NO		YES		NO		YES		YES		YES		YES	

9713515.0672

H3	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Sample Count 1	166.00000		206.00000		189.00000		1516.00000		205.00000		not requested		not requested		not requested		not requested	
6	Sample Count 2	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
7	Sample Count 3	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
8	Sample Count Time	50.00000		50.00000		50.00000		50.00000		50.00000		0.00000		0.00000		0.00000		0.00000	
9	WsubS1	15.06272		12.13974		13.23073		1.85592		12.19890		ERR		ERR		ERR		ERR	
10	WsubS2	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
11	WsubS3	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
12	Blank Count 1	201.00000		201.00000		201.00000		201.00000		201.00000		0.00000		0.00000		0.00000		0.00000	
13	Blank Count 2	195.00000		195.00000		195.00000		195.00000		195.00000		0.00000		0.00000		0.00000		0.00000	
14	Blank Count 3	194.00000		194.00000		194.00000		194.00000		194.00000		0.00000		0.00000		0.00000		0.00000	
15	Blank Count time	50.00000		50.00000		50.00000		50.00000		50.00000		0.00000		0.00000		0.00000		0.00000	
16	WsubB1	12.44145		12.44145		12.44145		12.44145		12.44145		0.00000		0.00000		0.00000		0.00000	
17	WsubB2	12.82394		12.82394		12.82394		12.82394		12.82394		0.00000		0.00000		0.00000		0.00000	
18	WsubB3	12.88999		12.88999		12.88999		12.88999		12.88999		0.00000		0.00000		0.00000		0.00000	
19	Blank CPM Average	3.93237		3.93237		3.93237		3.93237		3.93237		ERR		ERR		ERR		ERR	
20	Sample CPM average	3.32000		4.12000		3.78000		30.32000		4.10000		ERR		ERR		ERR		ERR	
21	Net CPM	-0.61237		0.18763		-0.15237		26.38763		0.16763		ERR		ERR		ERR		ERR	
22	Decay Correction	0.97547		0.97546		0.97546		0.97560		0.97560		0.00000		0.00000		0.00000		0.00000	
23	Efficiency	0.24100		0.24400		0.25200		0.24200		0.25000		0.00000		0.00000		0.00000		0.00000	
24	DPM of Aliquot	-2.60486		0.78831		-0.61996		111.76690		0.68726		ERR		ERR		ERR		ERR	
25	Aliquot	0.01000		0.01000		0.01000		0.01000		0.01000		0.00000		0.00000		0.00000		0.00000	
26	Reported Results (pCi/l)	-117.57000		35.51300		-27.87000		5034.80000		30.97600		0.00000		0.00000		0.00000		0.00000	
27	Calculated Results (pCi/l)	-117.33607	OK	35.50963	OK	-27.92178	OK	5034.54489	OK	30.96859	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
28	Reported MDA	144.55000		142.50000		137.71000		143.65000		139.13000		0.00000		0.00000		0.00000		0.00000	
29	Calculated MDA (method 1)	141.00618		139.27248		134.85113		140.42349		135.92694		ERR		ERR		ERR		ERR	
30	Calculated MDA (method 2)	141.02546		139.28154		134.86959		140.44271		135.94855		ERR		ERR		ERR		ERR	

9713515.0673

SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	ET	CTS	TIME	CPM	SF	CPM	X	Wx	Wb	WY	WX	WXY	WX^2
47		2 COMP=	0.00000	0.00000	*	P-FACTOR		C-ZERO						
48						1.75900		0.00000						
49														
50	9573-4	1.28700	172.00000	223.70000	0.56750	0.97890	0.19714	0.70713	212.53302	881.05727	41.86826	150.28757	29.82734	106.27221
51	BO1DL7	2.06700	71.00000	107.50000	0.54620	1.00440	0.11477	0.58100	156.34362	915.41560	15.64787	79.21500	9.09134	46.02354
52	Water	3.11000	78.00000	100.60000	0.54560	1.00330	0.23051	0.44321	111.93573	916.42229	25.80187	49.61079	11.43569	21.98769
53		4.13600	61.00000	100.60000	0.71180	1.02060	-0.10761	0.33947	132.73549	702.44451	0.13274	45.05955	0.04506	15.29629
54		5.02700	64.00000	100.20000	0.54130	0.96730	0.09424	0.28930	132.47017	923.70220	12.48357	38.87645	3.39185	9.60715
55		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
56		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
57		DELTA=	15129.34974					SUMS=	726.01804	4339.04186	95.96430	359.84732	53.58117	199.18712
58														
59						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
60		Y @ MILK	REPORTED	CALCULATED		0.80823		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
61		1 COMP=	0.27100	0.25690	OK					0.25690	0.25518	OK	0.22766	Yes
62		2 COMP=	NA	0.28769	*	P-FACTOR		C-ZERO						
63						1.75900		0.33270						
64														
65	9573-5	1.28700	102.00000	223.70000	0.51630	1.04830	-0.06325	0.70713	320.75138	966.42921	0.32075	226.81156	0.22681	160.35429
66	BO1DN5	2.06700	59.00000	107.50000	0.56750	0.97770	-0.01825	0.58100	158.52289	881.05727	0.15852	92.10104	0.09210	53.51027
67	water	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
68		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
69		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
70		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
71		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
72		DELTA=	808.91076					SUMS=	479.27427	1849.48648	0.47927	318.91260	0.31891	213.86456
73														
74						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
75		Y @ MILK	REPORTED	CALCULATED		0.77943		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
76		1 COMP=	NA	0.00149	*					0.00000	0.00000	*	0.25302	No
77		2 COMP=	0.00000	0.00000	*	P-FACTOR		C-ZERO						
78						1.75900		0.00000						
79														
80	9573-6	1.01900	87.00000	142.30000	0.51500	1.05220	0.10142	0.76146	184.82410	970.87379	18.74406	140.73689	14.27292	107.18606
81	BO1DY5	1.95600	77.00000	102.50000	0.53980	0.99760	0.21091	0.59816	117.15713	926.26899	24.70986	70.07690	14.78049	41.91851
82	water	3.01700	100.00000	100.30000	0.72340	1.01510	0.27774	0.45406	86.12727	691.18054	23.92103	39.10680	10.86154	17.75677
83		4.08600	47.00000	99.12000	0.51500	1.05170	-0.04294	0.34394	170.52005	970.87379	0.17052	58.84801	0.05865	20.17117
84		4.97100	66.00000	100.30000	0.52140	1.05140	0.14385	0.27325	129.85660	958.95886	18.65371	35.48310	5.09709	9.69570
85		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
86		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
87		DELTA=	17057.73096					SUMS=	688.48513	4518.15375	86.19917	344.05370	45.07070	196.70821
88														

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SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	IET	CTS	TIME	CPM	SF	CPM	X	Ws	Wb	WY	WX	WXY	WX^2
5	9573-1	not requested	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
6	BO1DH7	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
7	Water	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
8		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
9		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
10		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
11		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
12		DELTA=	0.00000					SUMS=	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
13														
14						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
15		Y @ MILK	REPORTED	CALCULATED		0.00000		0.00000		RESULTS	RESULTS		MDA	Results > MDA ?
16		1 COMP=	0.00000	ERR	ERR					0.00000	ERR	ERR	ERR	ERR
17		2 COMP=	0.00000	ERR	ERR	P-FACTOR		C-ZERO						
18						0.00000		ERR						
19														
20	9573-2	1.26700	127.00000	223.70000	0.53940	1.02440	0.02902	0.70713	271.06119	926.95588	7.86504	191.67434	5.56156	135.53786
21	BO1DJ0	2.06700	61.00000	107.50000	0.54130	0.96730	0.02529	0.58100	155.43453	923.70220	3.93048	90.50873	2.28559	52.46778
22	Water	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
23		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
24		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
25		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
26		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
27		DELTA=	870.27798					SUMS=	426.49672	1850.65808	11.79552	281.98107	7.84516	188.00564
28														
29						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
30		Y @ MILK	REPORTED	CALCULATED		0.76179		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
31		1 COMP=	NA	0.04173	*					0.03157	0.02976	OK	0.24089	No
32		2 COMP=	0.03100	0.02956	OK	P-FACTOR		C-ZERO						
33						1.75900		0.03881						
34														
35	9573-3	1.26700	98.00000	223.70000	0.54620	1.00500	-0.10865	0.70713	323.21152	915.41560	0.32321	228.55119	0.22855	161.61443
36	BO1DJ3	2.06700	48.00000	107.50000	0.53940	1.02650	-0.09535	0.58100	189.49244	926.95588	0.18949	110.09421	0.11009	63.96421
37	Water	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
38		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
39		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
40		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
41		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
42		DELTA=	974.35661					SUMS=	512.70396	1842.37148	0.51270	338.64540	0.33865	225.57884
43														
44						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
45		Y @ MILK	REPORTED	CALCULATED		0.78330		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
46		1 COMP=	NA	0.00150	*					-0.00000	-0.00000	*	0.23350	No

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H3	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Sample Count 1	166.00000		206.00000		189.00000		1516.00000		205.00000		not requested		not requested		not requested		not requested	
6	Sample Count 2	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
7	Sample Count 3	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
8	Sample Count Time	50.00000		50.00000		50.00000		50.00000		50.00000		0.00000		0.00000		0.00000		0.00000	
9	WsubS1	15.06772		12.13974		15.23073		1.85592		12.19990		ERR		ERR		ERR		ERR	
10	WsubS2	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
11	WsubS3	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
12	Blank Count 1	201.00000		201.00000		201.00000		201.00000		201.00000		0.00000		0.00000		0.00000		0.00000	
13	Blank Count 2	195.00000		195.00000		195.00000		195.00000		195.00000		0.00000		0.00000		0.00000		0.00000	
14	Blank Count 3	194.00000		194.00000		194.00000		194.00000		194.00000		0.00000		0.00000		0.00000		0.00000	
15	Blank Count time	50.00000		50.00000		50.00000		50.00000		50.00000		0.00000		0.00000		0.00000		0.00000	
16	WsubB1	12.44145		12.44145		12.44145		12.44145		12.44145		0.00000		0.00000		0.00000		0.00000	
17	WsubB2	12.82394		12.82394		12.82394		12.82394		12.82394		0.00000		0.00000		0.00000		0.00000	
18	WsubB3	12.88999		12.88999		12.88999		12.88999		12.88999		0.00000		0.00000		0.00000		0.00000	
19	Blank CPM Average	3.93237		3.93237		3.93237		3.93237		3.93237		ERR		ERR		ERR		ERR	
20	Sample CPM average	3.32000		4.12000		3.78000		30.32000		4.10000		ERR		ERR		ERR		ERR	
21	Net CPM	-0.61237		0.18763		-0.15237		26.38763		0.16763		ERR		ERR		ERR		ERR	
22	Decay Correction	0.97547		0.97546		0.97546		0.97560		0.97560		0.00000		0.00000		0.00000		0.00000	
23	Efficiency	0.24100		0.24400		0.25200		0.24200		0.25000		0.00000		0.00000		0.00000		0.00000	
24	DPM of Aliquot	-2.60486		0.78831		-0.61986		111.76690		0.68728		ERR		ERR		ERR		ERR	
25	Aliquot	0.01000		0.01000		0.01000		0.01000		0.01000		0.00000		0.00000		0.00000		0.00000	
26	Reported Results (pCi/l)	-117.57000		35.51300		-27.87000		5034.80000		30.97600		0.00000		0.00000		0.00000		0.00000	
27	Calculated Results (pCi/l)	-117.33607	OK	35.50953	OK	-27.92178	OK	5034.54469	OK	30.95859	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
28	Reported MDA	144.55000		142.50000		137.71000		143.65000		139.13000		0.00000		0.00000		0.00000		0.00000	
29	Calculated MDA (method 1)	141.00616		139.27248		134.85113		140.42349		136.92994		ERR		ERR		ERR		ERR	
30	Calculated MDA (method 2)	141.02546		139.29154		134.86959		140.44271		136.94855		ERR		ERR		ERR		ERR	

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SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	ET	CTS	TIME	CPM	SF	CPM	X	Wx	Wb	WY	WX	WXY	WX^2
89						PRODUCT		NBS CORR.			REPORTED	CALCULATED		Calculated	Reported
90		Y @ MILK	REPORTED	CALCULATED		0.24514		0.96800			RESULTS	RESULTS		MDA	Results > MDA ?
91		1 COMP=	NA	0.22912	*						0.25283	0.25190	OK	0.92945	No
92		2 COMP=	0.08100	0.08051	OK	P-FACTOR		C-ZERO							
93						1.75900		0.32643							
94															
95	9573-7	1.01900	84.00000	142.30000	0.57930	1.07880	0.01167	0.76146	185.69060	863.11065	2.20399	141.39685	1.67826	107.66860
96	BO1DY7	1.95600	77.00000	102.50000	0.56700	0.97890	0.18033	0.59816	116.41516	881.83422	20.99344	69.63509	12.55747	41.68304
97	water	0.00000	0.00000	0.00000	0.00000	0.96430	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
98		0.00000	0.00000	0.00000	0.00000	0.98290	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
99		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
100		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
101		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
102		DELTA=	576.48063					SUMS=	302.10598	1744.94487	23.19743	211.03194	14.23573	149.32184
103														
104						PRODUCT		NBS CORR.			REPORTED	CALCULATED		Calculated	Reported
105		Y @ MILK	REPORTED	CALCULATED		0.65777		0.96800			RESULTS	RESULTS		MDA	Results > MDA ?
106		1 COMP=	NA	0.09534	*						-1.21410	-1.20290	OK	0.37200	No
107		2 COMP=	-1.04100	-1.03180	OK	P-FACTOR		C-ZERO							
108						1.75900		-1.86536							
109															
110	9573-8	1.01900	75.00000	142.30000	0.63670	1.03840	-0.11355	0.76146	198.42310	785.29920	0.19842	151.09204	0.15109	115.08114
111	BO1DY9	1.95600	71.00000	102.50000	0.51500	1.05090	0.18673	0.59816	126.84898	870.87379	23.84878	76.75968	14.14579	45.31467
112	water	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
113		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
114		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
115		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
116		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
117		DELTA=	670.16023					SUMS=	325.07208	1756.17299	23.84721	226.84860	14.29689	160.36580
118														
119						PRODUCT		NBS CORR.			REPORTED	CALCULATED		Calculated	Reported
120		Y @ MILK	REPORTED	CALCULATED		0.38507		0.96800			RESULTS	RESULTS		MDA	Results > MDA ?
121		1 COMP=	NA	0.08915	*						-2.29080	-2.28530	OK	0.85358	No
122		2 COMP=	-1.15000	-1.13732	OK	P-FACTOR		C-ZERO							
123						1.75900		-2.95351							
124															
125	9573-9	1.01900	98.00000	142.30000	0.54440	1.00900	0.14559	0.76146	195.69485	818.44232	24.12259	120.17065	18.36848	96.07440
126	BO1DZ1	1.95600	58.00000	102.50000	0.57930	1.07790	-0.01449	0.59816	148.12255	863.11065	0.14812	88.60123	0.08860	52.99785
127	water	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
128		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
129		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
130		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000

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SR90	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2														
3			GROSS	COUNT	BKG		NET							
4	SAMPLE	#Y	CTS	TIME	CPM	SF	CPM	X	Wx	Wb	WY	WX	WXY	WX^2
131		0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
132		DELTA=	654.50793					SUMS=	313.61740	1781.55297	24.27072	214.77188	18.45709	149.07225
133														
134						PRODUCT		NBS CORR.		REPORTED	CALCULATED		Calculated	Reported
135		Y @ MILK	REPORTED	CALCULATED		0.34318		0.96800		RESULTS	RESULTS		MDA	Results > MDA ?
136		1 COMP=	0.12500	0.12381	OK					0.27849	0.27872	OK	0.68847	No
137		2 COMP=	NA	0.88538	*	P-FACTOR		C-ZERO						
138						1.75900		0.36079						
139														

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Tc99	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ9		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Sample Weight	not requested		0.20000		0.20000		0.20000		0.20000		not requested		not requested		not requested		not requested	
6	Average Net CPM	0.00000		0.59000		0.36000		0.92000		4.43000		0.00000		0.00000		0.00000		0.00000	
7	Detector P-Factor	0.00000		2.34000		2.34000		2.34000		2.34000		0.00000		0.00000		0.00000		0.00000	
8	Yield	0.00000		0.31150		0.67210		0.62980		0.37200		0.00000		0.00000		0.00000		0.00000	
9	Reported Results	0.00000		9.95760		2.83090		7.71180		62.73400		0.00000		0.00000		0.00000		0.00000	
10	Calculated Results	ERR	ERR	9.98221	OK	2.82294	OK	7.69871	OK	62.78155	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
11	Bkg 1	0.00000		0.77000		0.71000		0.43000		0.71000		0.00000		0.00000		0.00000		0.00000	
12	Time 1	0.00000		29.40000		29.40000		29.40000		29.40000		0.00000		0.00000		0.00000		0.00000	
13	SF 1	0.00000		1.01900		1.00500		0.97500		1.02700		0.00000		0.00000		0.00000		0.00000	
14	MDA 1	ERR		13.00189		5.70698		4.59813		10.53063		ERR		ERR		ERR		ERR	
15	Results > MDA ?	ERR		NO		NO		YES		YES		ERR		ERR		ERR		ERR	

9713515.0679

I129	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Time	not requested		251.20000		193.05000		906.63000		251.85000		not requested		not requested		not requested		not requested	
6	Bkg CPM	0.00000		1.15000		1.23300		1.20800		1.55300		0.00000		0.00000		0.00000		0.00000	
7	Blank CPM	0.00000		-0.58100		-0.58100		-0.58100		-0.58100		0.00000		0.00000		0.00000		0.00000	
8	Net	0.00000		0.24700		0.12500		0.15900		-0.16100		0.00000		0.00000		0.00000		0.00000	
9	Yield	0.00000		0.72150		0.71510		0.70910		0.65460		0.00000		0.00000		0.00000		0.00000	
10	Aliquot	0.00000		0.50000		0.50000		0.50000		0.50000		0.00000		0.00000		0.00000		0.00000	
11	P-Factor	0.00000		4.64000		4.64000		4.64000		4.64000		0.00000		0.00000		0.00000		0.00000	
12	Reported Results	0.00000		1.42900		0.73200		0.93640		-1.03100		0.00000		0.00000		0.00000		0.00000	
13	Calculated Results	ERR	ERR	1.49105	OK	0.73070	OK	0.93731	OK	-1.02812	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
14	Calculated MDA	ERR		20.36576		21.99571		21.75240		29.33851		ERR		ERR		ERR		ERR	
15	Results > MDA ?	ERR		NO		NO		NO		NO		ERR		ERR		ERR		ERR	

97135150680

IsoU	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY0		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	U232 Tracer Added (DPM)	10.25000		10.25000		10.25000		10.25000		10.25000		10.25000		10.25000		10.25000		10.25000	
6	Sample Size (g or l)	0.80000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
7	Tracer BKG (CPM)	0.00708		0.00406		0.01221		0.00608		0.00406		0.00955		0.00407		0.01221		0.01430	
8	Tracer Counts	2816.00000		1808.00000		1511.00000		1733.00000		1374.00000		1003.00000		876.00000		861.00000		930.00000	
9	Counting Time (min)	1194.87000		1011.95000		1032.45000		791.43000		876.93000		747.47000		747.47000		747.47000		746.22000	
10	Detector Efficiency	0.31950		0.27560		0.28530		0.33120		0.27530		0.25500		0.26850		0.28950		0.24880	
11	Reported Yield	0.71780		0.63100		0.49610		0.64300		0.55360		0.50980		0.42440		0.38410		0.48290	
12	Calculated Yield	0.71748	OK	0.63103	OK	0.49629	OK	0.64323	OK	0.55382	OK	0.50973	OK	0.42436	OK	0.38407	OK	0.48309	OK
13	[U234]																		
14	BKG (CPM)	0.00379		0.00162		0.00570		0.01042		0.00162		0.01215		0.00163		0.00488		0.00780	
15	Gross Counts	413.00000		14.00000		28.00000		7770.00000		688.00000		1418.00000		2142.00000		1271.00000		1180.00000	
16	U235 Counts	0.00000		0.00000		0.00000		50.00000		3.00000		11.00000		13.00000		6.00000		6.00000	
17	Branch Ratio	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
18	Tracer Counts	3.00000		3.00000		3.00000		3.00000		2.00000		2.00000		2.00000		2.00000		2.00000	
19	Reported Results (pCi/g or pCi/l)	0.83210		0.02304		0.05856		20.60000		2.29800		6.47100		11.24000		6.82300		5.85800	
20	Calculated Results (pCi/g or pCi/l)	0.83352	OK	0.02398	OK	0.05890	OK	20.59511	OK	2.29629	OK	6.47190	OK	11.24336	OK	6.82564	OK	5.85687	OK
21	MDA Reported	0.02140		0.01690		0.03520		0.09480		0.03140		0.09660		0.09220		0.07990		0.08110	
22	MDA Calculated	0.02627	*	0.02569	*	0.04282	*	0.09747	OK	0.03980	*	0.10151	OK	0.09925	OK	0.08619	OK	0.08704	OK
23	Results > MDA?	YES		YES		YES		YES		YES		YES		YES		YES		YES	
24	[U235]																		
25	BKG (CPM)	0.00126		0.00162		0.00163		0.00174		0.00162		0.00130		0.00000		0.00081		0.00000	
26	Gross Counts	25.00000		1.00000		1.00000		455.00000		31.00000		98.00000		120.00000		54.00000		59.00000	
27	U235 Counts	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
28	Branch Ratio	0.82600		0.82600		0.82600		0.82600		0.82600		0.82600		0.82600		0.82600		0.82600	
29	Tracer Counts	2.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
30	Table Counts	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
31	Reported Results (pCi/g or pCi/l)	0.05223		-0.00620		-0.00746		1.46500		0.11830		0.53880		0.76190		0.34120		0.35280	
32	Calculated Results (pCi/g or pCi/l)	0.05349	OK	-0.00508	*	-0.00628	*	1.46396	OK	0.11657	OK	0.53900	OK	0.76198	OK	0.34380	OK	0.35286	OK
33	MDA Reported	0.01640		0.02040		0.02460		0.01510		0.01900		0.02620		0.02980		0.03060		0.02830	
34	MDA Calculated	0.02170	*	0.02348	*	0.02848	*	0.02325	*	0.02958	*	0.03672	*	0.02984	OK	0.03874	*	0.02835	OK
35	Results > MDA?	YES		NO		NO		YES		YES		YES		YES		YES		YES	
36	[U238]																		
37	BKG (CPM)	0.00076		0.00081		0.00163		0.00217		0.00081		0.00174		0.00000		0.00081		0.00043	
38	Gross Counts	383.00000		5.00000		22.00000		7497.00000		628.00000		1276.00000		2174.00000		1246.00000		1172.00000	
39	U235 Counts	2.00000		0.00000		0.00000		45.00000		3.00000		10.00000		12.00000		5.00000		6.00000	
40	Branch Ratio	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
41	Tracer Counts	2.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
42	Reported Results (pCi/g or pCi/l)	0.77660		0.00768		0.05856		19.90000		2.10000		5.85900		11.43000		6.71400		5.85300	
43	Calculated Results (pCi/g or pCi/l)	0.77723	OK	0.00814	OK	0.05852	OK	19.90189	OK	2.09991	OK	5.85889	OK	11.42984	OK	6.71747	OK	5.84935	OK
44	MDA Reported	0.01660		0.01190		0.02030		0.08540		0.03140		0.07160		0.08540		0.06190		0.05730	
45	MDA Calculated	0.02121	*	0.01609	*	0.02553	*	0.06903	OK	0.03409	OK	0.07576	OK	0.06886	OK	0.06491	OK	0.06335	OK
46	Results > MDA?	YES		NO		YES		YES		YES		YES		YES		YES		YES	

9713515.0681

PU241	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	BKG time	?		?		?		?		?		?		?		?		?	
6	Gross Beta CPM	not requested		14.02000		14.51000		14.35000		15.03000		not requested		not requested		not requested		not requested	
7	Gross Alpha CPM	0.00000		6.65000		6.48000		8.00000		7.81000		0.00000		0.00000		0.00000		0.00000	
8	Bkg Beta CPM	0.00000		14.57000		14.57000		14.57000		14.57000		0.00000		0.00000		0.00000		0.00000	
9	BKG Alpha CPM	0.00000		3.66000		3.66000		3.66000		3.66000		0.00000		0.00000		0.00000		0.00000	
10	PU242 tracer added	0.00000		5.96000		5.96000		5.96000		5.96000		0.00000		0.00000		0.00000		0.00000	
11	Pu239 DPM of Aliquot	0.00000		0.00000		0.00490		0.00533		0.00775		0.00000		0.00000		0.00000		0.00000	
12	Pu239 DPM of Aliquot	0.00000		0.00404		0.00492		-0.00535		-0.00389		0.00000		0.00000		0.00000		0.00000	
13	Beta Efficiency	0.00000		0.34760		0.34760		0.34760		0.34760		0.00000		0.00000		0.00000		0.00000	
14	Alpha Efficiency	0.00000		0.96100		0.96100		0.96100		0.96100		0.00000		0.00000		0.00000		0.00000	
15	delta T = Time	0.00000		196.00000		196.00000		195.00000		185.00000		0.00000		0.00000		0.00000		0.00000	
16	wt (vol)	0.00000		1.00000		1.00000		1.00000		1.00000		0.00000		0.00000		0.00000		0.00000	
17	Reported Chemical Yield	0.00000		0.52170		Data missing		Data missing		Data missing		0.00000		0.00000		0.00000		0.00000	
18	Calculated Chemical Yield	ERR	ERR	0.52166	OK	0.49155	*	0.75774	*	0.72410	*	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
19	Reported Results	0.00000		-1.40000		0.16300		0.38700		0.82300		0.00000		0.00000		0.00000		0.00000	
20	Calculated Results	ERR	ERR	-1.40125	OK	-0.16224	*	-0.38584	*	0.84915	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
21	delta T > 180 ?	No		Yes		Yes		Yes		Yes		No		No		No		No	
22	Calculated MDA (LSC)	ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR	
23	Reported Results > MDA ?	ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR		ERR	

9213515.0682

IsoPu	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Pu242 Tracer Added (DPM)	NR		5.96000		5.96000		5.96000		5.96000		NR		NR		NR		NR	
6	Sample Size (g or l)	0.00000		1.00000		1.00000		1.00000		1.00000		0.00000		0.00000		0.00000		0.00000	
7	Tracer BKG (CPM)	0.00000		0.00260		0.00130		0.00120		0.00173		0.00000		0.00000		0.00000		0.00000	
8	Tracer Counts	0.00000		1483.00000		1218.00000		2238.00000		1539.00000		0.00000		0.00000		0.00000		0.00000	
9	Counting Time (min)	0.00000		792.42000		792.42000		1097.23000		792.42000		0.00000		0.00000		0.00000		0.00000	
10	Detector Efficiency	0.00000		0.39030		0.39760		0.39980		0.38430		0.00000		0.00000		0.00000		0.00000	
11	Reported Yield	0.00000		0.80310		0.84780		0.85540		0.84720		0.00000		0.00000		0.00000		0.00000	
12	Calculated Yield	ERR	ERR	0.80341	OK	0.84808	OK	0.85550	OK	0.84719	OK	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
13	[Pu236]																		
14	BKG (CPM)	0.00000		0.00087		0.00173		0.00409		0.00000		0.00000		0.00000		0.00000		0.00000	
15	Gross Counts	0.00000		2.00000		0.00000		4.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
16	Branch Ratio	0.00000		1.00000		1.00000		1.00000		1.00000		0.00000		0.00000		0.00000		0.00000	
17	Tracer Counts	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
18	Reported Results (pCi/g or pCi/l)	0.00000		0.00202		-0.00246		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
19	Calculated Results (pCi/g or pCi/l)	ERR	ERR	0.00238	*	0.00302	*	-0.00059	*	0.00000	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
20	MDA Reported	0.00000		0.00942		0.01150		0.01260		0.00906		0.00000		0.00000		0.00000		0.00000	
21	MDA Calculated	ERR	ERR	0.00702	*	0.01204	OK	0.01185	OK	0.00000	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
22	Results > MDA?	YES		NO		NO		NO		NO		YES		YES		YES		YES	
23	[Pu238]																		
24	BKG (CPM)	0.00000		0.00087		0.00130		0.00722		0.00087		0.00000		0.00000		0.00000		0.00000	
25	Gross Counts	0.00000		2.00000		2.00000		6.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
26	Branch Ratio	0.00000		1.00000		1.00000		1.00000		1.00000		0.00000		0.00000		0.00000		0.00000	
27	Tracer Counts	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
28	Reported Results (pCi/g or pCi/l)	0.00000		0.00182		0.00222		-0.00241		-0.00175		0.00000		0.00000		0.00000		0.00000	
29	Calculated Results (pCi/g or pCi/l)	ERR	ERR	0.00238	*	0.00214	OK	-0.00231	OK	-0.00120	*	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
30	MDA Reported	0.00000		0.00848		0.01030		0.01590		0.00817		0.00000		0.00000		0.00000		0.00000	
31	MDA Calculated	ERR	ERR	0.00702	*	0.01044	OK	0.01574	OK	0.00676	*	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
32	Results > MDA?	YES		NO		NO		NO		NO		YES		YES		YES		YES	
33	[Pu239]																		
34	BKG (CPM)	0.00000		0.00173		0.00130		0.00168		0.00043		0.00000		0.00000		0.00000		0.00000	
35	Gross Counts	0.00000		1.00000		2.00000		4.00000		2.00000		0.00000		0.00000		0.00000		0.00000	
36	Branch Ratio	0.00000		1.00000		1.00000		1.00000		1.00000		0.00000		0.00000		0.00000		0.00000	
37	Tracer Counts	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
38	Reported Results (pCi/g or pCi/l)	0.00000		0.00000		0.00222		0.00240		0.00349		0.00000		0.00000		0.00000		0.00000	
39	Calculated Results (pCi/g or pCi/l)	ERR	ERR	-0.00067	*	0.00214	OK	0.00259	OK	0.00290	*	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
40	MDA Reported	0.00000		0.00845		0.01030		0.00791		0.00814		0.00000		0.00000		0.00000		0.00000	
41	MDA Calculated	ERR	ERR	0.00999	*	0.01044	OK	0.00759	OK	0.00475	*	ERR	ERR	ERR	ERR	ERR	ERR	ERR	ERR
42	Results > MDA?	YES		NO		NO		NO		NO		YES		YES		YES		YES	

9713515.0603

Gamma	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	Sample #	9573-1		9573-2		9573-3		9573-4		9573-5		9573-6		9573-7		9573-8		9573-9	
3	Cust. I.D. #	BO1DH7		BO1DJ0		BO1DJ3		BO1DL7		BO1DN8		BO1DY5		BO1DY7		BO1DY9		BO1DZ1	
4	Type	Water		Water		Water		Water		water		water		water		water		water	
5	Detector	G-2 MB		G-3 MB		G-3 MB		G-2 MB		G-3 MB		G-5 MB		G-2 MB		G-3 MB		G-2 MB	
6	Aliquot (g or l)	5.00000		0.50000		0.50000		0.50000		0.50000		0.50000		0.50000		0.50000		0.50000	
7	Counting Time (min)	985.58000		402.87000		493.73000		1185.72000		1166.27000		1166.43000		444.70000		444.82000		891.13000	
8	[Cobalt 60; Co-60]																		
9	Background CTS	24.00000		0.00000		0.00000		44.00000		0.00000		0.00000		0.00000		24.00000		33.00000	
10	Background CPM	0.07220		0.02110		0.02110		0.07650		0.02110		0.01170		0.07560		0.02420		0.07560	
11	Net CPM	0.04200		0.06900		0.04700		0.03600		0.03500		0.03000		0.06600		0.06300		0.04700	
12	Branch Fraction	1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000		1.00000	
13	Efficiency	0.00343		0.00366		0.00366		0.00343		0.00366		0.00382		0.00343		0.00366		0.00343	
14	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*
15	Calculated Results (pCi/g or pCi/l)	1.10314		16.98420		11.56895		9.45552		8.61517		7.07514		17.33512		15.50731		12.34471	
16	Reported MDA	1.17200	OK	18.12000	OK	12.30000	OK	10.16000	OK	9.15000	OK	7.59900	OK	18.48000	OK	16.52000	OK	13.16000	OK
17	Calculated MDA	1.21144		8.30120		7.49867		12.11686		4.87692		3.48067		15.95865		15.20430		13.76032	
18	Detect/Non Detect	Non Detect	NO	Non Detect	YES	Non Detect	YES	Non Detect	NO	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	NO
19	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
20	[Cesium 137; Cs-137]																		
21	Background CTS	0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000		0.00000	
22	Background CPM	0.02700		0.03210		0.03210		0.02700		0.03210		0.00000		0.02700		0.03280		0.02700	
23	Net CPM	0.04300		0.10300		0.09000		0.04800		0.05400		0.04500		0.07300		0.09500		0.05100	
24	Branch Fraction	0.85100		0.85100		0.85100		0.85100		0.85100		0.85100		0.85100		0.85100		0.85100	
25	Efficiency	0.00673		0.00734		0.00734		0.00673		0.00734		0.00732		0.00673		0.00734		0.00673	
26	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*	<	*
27	Calculated Results (pCi/g or pCi/l)	0.67940		14.86555		12.98067		7.55046		7.78634		6.50602		11.48300		13.70172		8.02237	
28	Reported MDA	0.68840	OK	15.00000	OK	13.10000	OK	7.58100	OK	7.91100	OK	6.58300	OK	11.60000	OK	13.79000	OK	8.15100	OK
29	Calculated MDA	0.38367		5.99639		5.41932		3.52779		3.52606		0.00000		5.71172		5.77141		4.03487	
30	Detect/Non Detect	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES	Non Detect	YES
31	Results > MDA?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
32	[Thorium 228; Th-228]																		
33	Background CTS	423.00000		398.00000		444.00000		585.00000		1339.00000		726.00000		248.00000		461.00000		459.00000	
34	Background CPM	0.14690		0.18620		0.23440		0.14060		0.22370		0.27930		0.14620		0.18300		0.14620	
35	Net CPM	0.10100		0.20800		0.19500		0.09300		0.12100		0.11100		0.10800		0.20100		0.09400	
36	Branch Fraction	0.44800		0.44800		0.44800		0.44800		0.44800		0.44800		0.44800		0.44800		0.44800	
37	Efficiency	0.01731		0.02043		0.02043		0.01731		0.02043		0.01866		0.01731		0.02043		0.01731	
38	Reported Results (pCi/g or pCi/l)	<	*	<	*	<	*	12.91000	*	<	*	<	*	15.00000	*	<	*	13.01000	*
39	Calculated Results (pCi/g or pCi/l)	1.17334		20.47369		19.19399		10.80401		11.91012		11.96218		12.64650		19.78467		10.92018	
40	Reported MDA	1.41200	*	24.39000	*	22.89000	*	NA	*	14.20000	*	14.31000	*	NA	*	23.71000	*	NA	*
41	Calculated MDA	1.30884		24.78218		21.97943		12.70863		15.73125		13.96297		21.53790		24.01557		14.74717	
42	Detect/Non Detect	Non Detect	NO	Non Detect	NO	Non Detect	NO	Detect	NO	Non Detect	NO	Non Detect	NO	Detect	NO	Non Detect	NO	Detect	NO
43	Results > MDA?	YES	YES	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES	NO	YES	YES	YES	NO	YES

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TMA/Norcal N1-12-104-7003

First Round Groundwater Samples

Gross Alpha

MDA	2xMDA	5xMDA
1.760	3.520	8.800

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-38	-0.070	-0.400	-140.4	Jor UJ
9573-39	-0.500	-0.300	-50.000	
7003-18	6.850	3.300	69.951	

Gross Beta

MDA	2xMDA	5xMDA
1.840	3.680	9.200

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-38	3.830	4.420	14.303	ok
9573-39	6.020	4.170	36.310	
7003-18	12.100	18.100	39.735	

Tritium

MDA	2xMDA	5xMDA
126.690	253.380	633.450

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-56	355	-114	389	Jor UJ
9573-57	-279	199	-1195	

Strontium 90

MDA	2xMDA	5xMDA
0.298	0.596	1.490

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-14	0.032	0.041	25.173	
9573-15	0.000	-0.154	-200	Jor UJ
7003-15	0.190	0.272	35.498	

Tech 99

MDA	2xMDA	5xMDA
4.508	9.016	22.540

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-26	9.960	1.650	143	Jor UJ
9573-27	2.830	0.603	130	

I129

MDA	2xMDA	5xMDA
0.019	0.039	0.097

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-44	1.430	0.110	171.429	Jor UJ
9573-45	0.732	2.520	109.963	

Isotopic U

Uranium 233/234

MDA	2xMDA	5xMDA
0.038 ~~0.381~~	0.762	1.905

Customer I.D. #	Original S	Duplicate D	RPD	Q
7003-12	6.750	8.900	27.476	ok
9573-21	0.059	0.678	168.178	

Uranium 235

MDA	2xMDA	5xMDA
0.015	0.030	0.076

Customer I.D. #	Original S	Duplicate D	RPD	Q
7003-12	0.682	0.793	15.051	ok
9573-21	-0.075	0.057	-1476	

Uranium 238

MDA	2xMDA	5xMDA
0.027	0.053	0.133

Customer I.D. #	Original S	Duplicate D	RPD	Q
7003-12	6.010	8.550	34.890	ok
9573-21	0.059	0.685	168	

Original in N1-12-104-7003

9713515 0685

Isotopic Pu

Pu238

MDA	2xMDA	5xMDA
0.005	0.010	0.024

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-14	0.002	-0.002	8689	Jor UJ
9573-15	0.002	-0.010	-300	
9573-60	-0.002	0.001	-600	

Pu239

MDA	2xMDA	5xMDA
0.005	0.010	0.024

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-14	0.000	0.004	200	
9573-15	0.002	-0.004	-600	Jor UJ
9573-60	0.002	0.002	4.691	

Pu241

MDA	2xMDA	5xMDA
*	0.000	0.000

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-14	1.400	-2.080	-1024	Jor UJ
9573-15	0.163	-13.940	-205	
9573-60	0.380	-1.450	-342	

* MDA not reported and cannot be calculated

Gamma Spec

Colbolt 60

MDA	2xMDA	5xMDA
10.790	21.580	53.950

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-50	17.870	16.080	10.545	ok
9573-51	12.300	16.540	29.404	
7003-21	16.790	19.460	14.731	

Cesium 137

MDA	2xMDA	5xMDA
9.175	18.350	45.875

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-50	15.000	15.510	3.343	
9573-51	13.100	9.731	29.513	ok
7003-21	22.890	34.590	40.710	

Thorium 228

MDA	2xMDA	5xMDA
12.630	25.260	63.150

Customer I.D. #	Original S	Duplicate D	RPD	Q
9573-50	24.320	21.390	12.820	ok
9573-51	22.890	34.590	40.710	
7003-21	18.140	23.870	27.279	

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