9304L088-WES-1128

9613401.1403

0042965

244

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: WESTINGHOUSE HANFORD
RFW #: 9304L088

W.O. #: 06168-002-001-9999-00
Date Received: 04-02-93

GC/MS VOLATILE

The set of samples consisted of two (2) water samples collected on 03-31-93.

The samples were analyzed according to criteria set forth in CLP SOW 03/90 for TCL Volatile target compounds on 04-05-93.

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

1. Non-target compounds were not detected in these samples.
2. All system monitoring compound (surrogate) recoveries were within EPA QC limits.
3. All matrix spike recoveries were within EPA QC limits.
4. The laboratory blank contained the common contaminants Methylene Chloride and Acetone at levels less than the CRQL.
5. All internal standard area and retention time criteria were met.

J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

05.04.93
Date

0013

sma/voa/04-088v.cn

9613401.1404

6

Westinghouse Hanford Company

CHAIN OF CUSTODY 9304L088

Custody Form Initiator KD LEE/GG HAMILTON

Company Contact PH BUTCHER

Telephone (509) 376-5045

Project Designation/Sampling Locations 100-FR-3

Collection Date 3/31/93

Ice Chest No. RM #105

Field Logbook No. EFC-1054

Bill of Lading/Airbill No. [illegible]

Offsite Property No. W93-[illegible]

Method of Shipment EMERY

Shipped to WESTON

Possible Sample Hazards/Remarks

Sample Identification

B088P6

2, 40ml, Gs, WATER; CLP-VOA
3, 2L, aG, WATER; CLP-SEMI VOA & PCB's/PEST
1, 500ml, P, WATER; ANIONS(IC) SO4,F,PO4,Cl/COND./pH - 1 qtr
1, 250ml, P, WATER; NO2-NO3 (H2SO4)
1, 500ml, P, WATER; ALKALINITY/TOTAL DISSOLVED SOLIDS
1, 1L, P, WATER; SULFIDE (Zink Acetate = NaOH pH>9) - 500 ml Amber Glass
1, 500ml, G, WATER; AMMONIA/CHEMICAL OXYGEN DEMAND (H2SO4 pH<2)
1, 1L, P, WATER; ICP/AA METALS, Hg (HNO3) UNFILTERED
1, 1L, P, WATER; Cn (NaOH)
1, 125ml, aGs, WATER; TOC (H2SO4)
1, 250ml, aGs, WATER; TOX (H2SO4)
2, 4L, P, WATER; GROSS ALPHA/GROSS BETA/GAMMA SPEC./ ALPHA SPEC.(to include U-235/238,Pu-239/240, Am-241), Sr-90 (HNO3)
1, 1L, G/P,WATER; Tc-99 (HCl)
1, 250ml, Gs, WATER; TRITIUM/C-14

B088P7

1, 1L, P, WATER; ICP/AA METALS, Hg (HNO3) FILTERED

B088P8

3, 40ml, Gs, WATER; CLP-VOA

[] Field Transfer of Custody — Chain of Possession — (Sign and Print Names)

Relinquished By	Date	Time	Received By	Date	Time
K.D. Lee K.D. Lee	3/31/93	1347	PH Butcher PH Butcher	4/1/93	0830
PH Butcher PH Butcher	4/1/93	0830	[illegible] 4/1/93		
EMERY	4/2/93	1128	Susan Pesko	4/2/93	1128

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments: FR16. # 5

0003

A-6000-407 (12/92) WEF061

9613401.1405

Westinghouse Hanford Company

SAMPLE ANALYSIS REQUEST

PART I: FIELD SECTION

Collector K. Lee, L. Walker Date Sampled [illegible] Time [illegible] hours

Company Contact P. H. Butcher Telephone (509) 376-5045

Sample Number	Number and Type of Sample Containers	Type of Sample*	Analysis Requested
BO [illegible]	2; 40ml; Gs*;	WATER	CLP-VOA
	3; 2L; aG;	WATER	CLP-SEMI VOA & PCB's/PEST
	1; 500ml; P;	WATER	ANIONS (IC) SO4, F, PO4, Cl/COND/pH
	1; 250ml; P;	WATER	NO3-NO2 (H2SO4)
	1; 500ml; P;	WATER	ALK./TOT. DISSOLVED SOLIDS
	1; 1L; P;	WATER	SULFIDE (add Zinc Acetate+NaOH pH>9)
	1; 500ml; G;	WATER	AMMONIA/CHEMICAL OXYGEN DEMAND (H2SO4 pH<2
	1; 1L; P;	WATER	CLP-ICP/AA METALS & Hg (HNO3) UNFILTERED
	1; 1L; P;	WATER	CLP-CN (NaOH)
	2; 4L; P;	WATER	GROSS ALPHA/BETA, GAMMA SPEC, ALPHA SPEC
			(U-235/238,Pu-239/240, Am-241), Sr-90,(HNO3)
	1; 1L; G/P;	WATER	Tc-99 (HCl)
	1; 250ml; Gs;	WATER	TRITIUM/C-14
	1; 125ml; aGs;	WATER	TOC (H2SO4)
	1; 250ml; aGs	WATER	TOX (H2SO4)
BO 88.07	1; 1L; P;	WATER	CLP-ICP/AA METAL & Hg (HNO3) FILTERED (HNO3)
BO 88.08	3; 40ml; Gs	WATER	CLP-VOA
			OPC: # W93-0-0321-42
			BOL: # 2536954552
			TASK#: 93-051

Field Information** _____

Special Handling and/or Storage _____

Possible Sample Hazards _____

PART II: LABORATORY SECTION

Received by _____ Title _____ Date _____

Analysis Required _____

0004

*Indicate whether sample is soil, sludge, water, etc.

**Use back of page for additional information relative to sample location.

A-6000-406(05/90

9613R09.04 1406 KHW# 4944L000

Contractor	OFF-SITE PROPERTY CONTROL	CONTROL NUMBER (To be obtained from PROPERTY MANAGEMENT)
WHC		[illegible]

PART I – TO BE COMPLETED BY ORIGINATOR

Department	Section	Unit
Env. Eng. & Tech.	Geosciences	Geochem. & Hydrochem

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

Routing Emery ☒ Contractor ☐ Vendor

Shipped to Weston
208 Welch Pool Rd.
Lionville, PA 19341

Off-site Custodian

Full Title

Quantity	Description (Include Serial and any Government Tag Numbers)	Original Cost
1 ~7 lbs.	Sample #: [illegible] Cooler ID: EM-165 Polycooler with groundwater samples packed in wet ice and vermiculite	N/A
1 lbs.	~~Sample #:~~ ~~Cooler ID:~~ ASS 4/1/93 ~~Polycooler with groundwater samples packed in wet ice and vermiculite~~	N/A

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

Necessity for the Off-Site Use of this Property

Sampling supports RI/FS work in the [illegible]

Bill of lading # [illegible]

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
[illegible]	[illegible]	[illegible]

Location of Property (Area & Bldg.)	Contact	Phone
[illegible]	PH Butcher	(509) 376 [illegible]

Date Ready for Shipment	Cost Code to be Charged	Approximate Date This Property will be Returned
	W81232 [illegible]	

Originated By	Date	Authorized By	Date
[illegible]		[illegible]	

Signature and Name of Property Control	Custodian Date	Property Management Approval	Date
		[illegible]	4/16/93

PART II – TO BE COMPLETED BY SHIPPING

Signature of Recipient	Return Order No.	Date Issued	Purchase Order No.	Date Issued
Date				

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

0006

54-3000-479 (09/89)

0007

REF # - BOULDER

FORM OF PAYMENT

Check ☐ Cash ☐ FCCOD ☐

Bill to Shipper ☒ Bill to Consignee ☐ Third Party Billing ☐

A5028LSAS

EMERY WORLDWIDE

Copy

SERVICES

UNITED STATES / CANADA: Next Day ☐ PM ☐ Saturday Delivery ☐

INTERNATIONAL: Express ☐ Standard Plus ☐ Preferred ☐ Standard ☐ Business Documents ☐ Customs Clearance ☐ Delivery ☐

Shipment Number 253695455 2

From:
WESTINGHOUSE SHIPPING DEPT. (509) 376-6065
U.S. DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD
BLDG 1163
2355 STEVENS DRIVE
RICHLAND WA Canada ☐

To:
WESTON
WESTON
208 WEST POOL ROAD
BLUEBELL PA Canada ☐ Hold for Pick Up ☐

Tariff Dest. | Gateway

Charges to Shipper $

EMERY WORLDWIDE will accept Consignee's check with all risks being assumed by Shipper, including but not limited to non-payment, fraud and misrepresentation.

Customer's Reference Numbers: W81232 PD3BA W93-0-0321#32 99352

Consignee's Account Number: 19341

Description	Pcs.	Dimensions L	W	H	Total Pieces	Total Weight (in Lbs.)
COOLER 1D RM-105 WATER SAMPLES	1				1	99

FOR INFORMATION OR RATES CALL 1-800-4 EMERY (1-800-443-6379)

Declared Value $

2 5 3 6 9 9 4 5 5 2

Remarks: OVERNIGHT DELIVERY SIGNATURE SECURITY SERVICE

Zip Ship ☒ For shipments within the 50 United States Shipper has the option to check this box and, by checking, agrees that the Zip Ship conditions, described on this area to the right, apply.

Mark if Emery Packaging ☐ Urgent Letter ☐ Urgent Pack ☐

Shipper's Signature X

International Shipments: Free Domestic ☐ Commodity Code

Third Party Billing Acc. No.

Customs ☐ International Insurance

Base Charge

Total Transportation Charges

Other Charges/Advance at Origin (OC/AO) ☐

5-PAL-4

Terms and Conditions on Back

0008

RFW# 93044088

EMERY WORLDWIDE — A CF Company

SIGNATURE AND TALLY RECORD

60029-46 (8/89) Litho USA

DATE: 04-01-93 SHIPMENT NO.: 253605455 2 8

SHIP: WESTINGHOUSE SHIPPING DEPT. (509) 376-6665

REFERENCE NO.: WHC-S-0321 #02

SHIPPER NAME AND ADDRESS	CONSIGNEE NAME AND ADDRESS
WESTINGHOUSE SHIPPING DEPT. (509) 376-6665 B2-06 U.S. DEPARTMENT OF ENERGY C/O WESTINGHOUSE HANFORD COMPANY 2355 STEVENS DRIVE 1163 BUILDING PO BOX 1970 RICHLAND WA 99352 PSC	WESTON 200 WELSH POOL ROAD LIONVILLE PA 19341

Pieces	Weight	Description/Marks	Emery Authorization No.
1	99 LBS	COOLER ID BW105 WATER SAMPLES	

EACH PERSON HANDLING OR TAKING CUSTODY OF THIS SHIPMENT MUST SIGN AND COMPLETE THE INFORMATION BELOW

	Name of Person/Company	Transship Point/Destination	Signature of Person Accepting Custody	Time/Date
1.				
2.				
3.				
4.				
5	WJ WASH	EWW PHL		4/1
6.	W.D SNYDER EWW	PH'L	W Snyder	1610 12
7.	E CHANDLER WILSTON	LIONVILLE		1125 4/4/93
8.				

SPECIAL HANDLING INSTRUCTIONS

CONSIGNEE COPY

9613401.1408

Roy F. Weston, Inc. - Lionville Laboratory
Volatiles by GC/MS, HSL List

RFW Batch Number: 9304L088 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-0 Report Date: 04/28/93 14:00 Page: 1a

0010

	Cust ID:	B088P6		B088P6		B088P6		B088P8		VBLK	
Sample Information	RFW#:	001		001 MS		001 MSD		003		93LVB071-MB1	
	Matrix:	WATER		WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00		1.00	
	Units:	UG/L		UG/L		UG/L		UG/L		UG/L	
Surrogate Recovery	Toluene-d8	97	%	100	%	97	%	103	%	101	%
	Bromofluorobenzene	87	%	93	%	91	%	95	%	88	%
	1,2-Dichloroethane-d4	94	%	104	%	107	%	109	%	102	%
Chloromethane		10	U	10	U	10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U	10	U
Methylene Chloride		1	JB	1	JB	1	JB	5	JB	7	J
Acetone		10	U	10	U	10	U	14	B	1	J
Carbon Disulfide		10	U	10	U	10	U	10	U	10	U
1,1-Dichloroethene		10	U	119	%	118	%	10	U	10	U
1,1-Dichloroethane		10	U	10	U	10	U	10	U	10	U
1,2-Dichloroethene (total)		10	U	10	U	10	U	10	U	10	U
Chloroform		9	J	9	J	8	J	10	U	10	U
1,2-Dichloroethane		10	U	10	U	10	U	10	U	10	U
2-Butanone		10	U	10	U	10	U	10	U	10	U
1,1,1-Trichloroethane		10	U	10	U	10	U	10	U	10	U
Carbon Tetrachloride		10	U	10	U	10	U	10	U	10	U
Bromodichloromethane		10	U	10	U	10	U	10	U	10	U
1,2-Dichloropropane		10	U	10	U	10	U	10	U	10	U
cis-1,3-Dichloropropene		10	U	10	U	10	U	10	U	10	U
Trichloroethene		3	J	102	%	106	%	10	U	10	U
Dibromochloromethane		10	U	10	U	10	U	10	U	10	U
1,1,2-Trichloroethane		10	U	10	U	10	U	10	U	10	U
Benzene		10	U	104	%	110	%	10	U	10	U
trans-1,3-Dichloropropene		10	U	10	U	10	U	10	U	10	U
Bromoform		10	U	10	U	10	U	10	U	10	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U	10	U	10	U
Tetrachloroethene		10	U	10	U	10	U	10	U	10	U
1,1,2,2-Tetrachloroethane		10	U	10	U	10	U	10	U	10	U
Toluene		10	U	103	%	108	%	10	U	10	U

*= Outside of EPA CLP QC limits.

9613401.1409

RFW Batch Number: 9304L088 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-0 Page: 1b

Cust ID:	B088P6		B088P6		B088P6		B088P8		VBLK	
RFW#:	001		001 MS		001 MSD		003		93LVB071-MB1	
Chlorobenzene	10	U	107	%	111	%	10	U	10	U
Ethylbenzene	10	U	10	U	10	U	10	U	10	U
Styrene	10	U	10	U	10	U	10	U	10	U
Xylene (total)	10	U	10	U	10	U	10	U	10	U

*= Outside of EPA CLP QC limits.

0011

9613401.1125

9613401.1411

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: B040508

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: not dec.

Date Analyzed: 04/05/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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	1	JB
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	9	J
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	3	J
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

9613401.1412

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: B040508

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: not dec.

Date Analyzed: 04/05/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

9613401.1413

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B088P8

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: B040509

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: not dec.

Date Analyzed: 04/05/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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	JB
67-64-1	Acetone	14	B
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B088P8

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: B040509

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: not dec.

Date Analyzed: 04/05/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

WESTON
MANAGERS DESIGNERS/CONSULTANTS

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: WESTINGHOUSE HANFORD
RFW #: 9304L088

W.O. #: 06168-002-001-9999-00
Date Received: 04-02-93

SEMIVOLATILE

One (1) water sample was collected on 03-31-93.

The sample and its associated QC samples were extracted on 04-06-93 and analyzed according to criteria set forth in CLP SOW 03/90 for TCL Semivolatile target compounds on 04-26-93.

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

1. Non-target compounds were detected in these samples.

2. All surrogate recoveries were within EPA QC limits.

3. Three (3) of twenty-two (22) matrix spike recoveries were outside EPA QC limits.

4. Two (2) of eleven (11) blank spike recoveries were outside EPA QC limits.

5. The laboratory blank 93LE0488-MB1 contained the common contaminants Di-n-butylphthalate and Bis(2-ethylhexyl)phthalate at levels less than the CRQL.

6. All internal standard area and retention time criteria were met.

04.30.93
Date

J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

sma/bna/04-088b.cn

Roy F. Weston, Inc. - Lionville Laboratory
Semivolatiles by GC/MS, HSL List

RFW Batch Number: 9304L088 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-0 Report Date: 04/29/93 10:18 Page: 1a

	Cust ID:	B088P6		B088P6		B088P6		SBLK		SBLK BS	
Sample Information	RFW#:	001		001 MS		001 MSD		93LE0488-MB1		93LE0488-MB1	
	Matrix:	WATER		WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00		1.00	
	Units:	ug/L		ug/L		ug/L		ug/L		ug/L	
Surrogate Recovery	Nitrobenzene-d5	71	%	71	%	69	%	76	%	71	%
	2-Fluorobiphenyl	62	%	62	%	58	%	70	%	68	%
	P-Terphenyl-d14	51	%	88	%	91	%	98	%	92	%
	Phenol-d5	65	%	73	%	68	%	73	%	58	%
	2-Fluorophenol	63	%	67	%	62	%	71	%	63	%
	2,4,6-Tribromophenol	88	%	93	%	100	%	93	%	95	%
	2-Chlorophenol-d4	68	%	74	%	66	%	77	%	70	%
	1,2-Dichlorobenzene-d4	56	%	62	%	55	%	60	%	54	%
Phenol		10	U	74	%	68	%	10	U	71	%
bis(2-Chloroethyl)ether		10	U	20	U	19	U	10	U	10	U
2-Chlorophenol		10	U	73	%	67	%	10	U	69	%
1,3-Dichlorobenzene		10	U	20	U	19	U	10	U	10	U
1,4-Dichlorobenzene		10	U	58	%	53	%	10	U	49	%
1,2-Dichlorobenzene		10	U	20	U	19	U	10	U	10	U
2-Methylphenol		10	U	20	U	19	U	10	U	10	U
2,2'-oxybis(1-Chloropropane)		10	U	20	U	19	U	10	U	10	U
4-Methylphenol		10	U	20	U	19	U	10	U	10	U
N-Nitroso-di-n-propylamine		10	U	77	%	74	%	10	U	79	%
Hexachloroethane		10	U	20	U	19	U	10	U	10	U
Nitrobenzene		10	U	20	U	19	U	10	U	10	U
Isophorone		10	U	20	U	19	U	10	U	10	U
2-Nitrophenol		10	U	20	U	19	U	10	U	10	U
2,4-Dimethylphenol		10	U	20	U	19	U	10	U	10	U
bis(2-Chloroethoxy)methane		10	U	20	U	19	U	10	U	10	U
2,4-Dichlorophenol		10	U	20	U	19	U	10	U	10	U
1,2,4-Trichlorobenzene		10	U	64	%	58	%	10	U	57	%
Naphthalene		10	U	20	U	19	U	10	U	10	U
4-Chloroaniline		10	U	20	U	19	U	10	U	10	U
Hexachlorobutadiene		10	U	20	U	19	U	10	U	10	U
4-Chloro-3-methylphenol		10	U	84	%	85	%	10	U	85	%
2-Methylnaphthalene		10	U	20	U	19	U	10	U	10	U
Hexachlorocyclopentadiene		10	U	20	U	19	U	10	U	10	U

*= Outside of EPA CLP QC limits.

0010

9418.0046.96

RFW Batch Number: 9304L088 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-0 Page: 1b

Cust ID:	BO88P6		BO88P6		BO88P6		SBLK		SBLK BS	
RFW#:	001		001 MS		001 MSD		93LE0488-MB1		93LE0488-MB1	
2,4,6-Trichlorophenol	10	U	20	U	19	U	10	U	10	U
2,4,5-Trichlorophenol	25	U	49	U	48	U	25	U	25	U
2-Chloronaphthalene	10	U	20	U	19	U	10	U	10	U
2-Nitroaniline	25	U	49	U	48	U	25	U	25	U
Dimethylphthalate	10	U	20	U	19	U	10	U	10	U
Acenaphthylene	10	U	20	U	19	U	10	U	10	U
2,6-Dinitrotoluene	10	U	20	U	19	U	10	U	10	U
3-Nitroaniline	25	U	49	U	48	U	25	U	25	U
Acenaphthene	10	U	74	%	74	%	10	U	75	%
2,4-Dinitrophenol	25	U	49	U	48	U	25	U	25	U
4-Nitrophenol	25	U	105 *	%	108 *	%	25	U	107 *	%
Dibenzofuran	10	U	20	U	19	U	10	U	10	U
2,4-Dinitrotoluene	10	U	90	%	94	%	10	U	90	%
Diethylphthalate	10	U	20	U	19	U	10	U	10	U
4-Chlorophenyl-phenylether	10	U	20	U	19	U	10	U	10	U
Fluorene	10	U	20	U	19	U	10	U	10	U
4-Nitroaniline	25	U	49	U	48	U	25	U	25	U
4,6-Dinitro-2-methylphenol	25	U	49	U	48	U	25	U	25	U
N-Nitrosodiphenylamine (1)	10	U	20	U	19	U	10	U	10	U
4-Bromophenyl-phenylether	10	U	20	U	19	U	10	U	10	U
Hexachlorobenzene	10	U	20	U	19	U	10	U	10	U
Pentachlorophenol	25	U	94	%	118 *	%	25	U	113 *	%
Phenanthrene	10	U	20	U	19	U	10	U	10	U
Anthracene	10	U	20	U	19	U	10	U	10	U
Carbazole	10	U	20	U	19	U	10	U	10	U
Di-n-butylphthalate	1	JB	2	JB	3	JB	1	J	1	JB
Fluoranthene	10	U	20	U	19	U	10	U	10	U
Pyrene	10	U	92	%	94	%	10	U	94	%
Butylbenzylphthalate	10	U	20	U	19	U	10	U	10	U
3,3'-Dichlorobenzidine	10	U	20	U	19	U	10	U	10	U
Benzo(a)anthracene	10	U	20	U	19	U	10	U	10	U
Chrysene	10	U	20	U	19	U	10	U	10	U
bis(2-Ethylhexyl)phthalate	0.7	JB	1	JB	3	JB	0.8	J	0.7	JB
Di-n-octyl phthalate	10	U	20	U	19	U	10	U	10	U
Benzo(b)fluoranthene	10	U	20	U	19	U	10	U	10	U
Benzo(k)fluoranthene	10	U	20	U	19	U	10	U	10	U
Benzo(a)pyrene	10	U	20	U	19	U	10	U	10	U
Indeno(1,2,3-cd)pyrene	10	U	20	U	19	U	10	U	10	U
Dibenz(a,h)anthracene	10	U	20	U	19	U	10	U	10	U
Benzo(g,h,i)perylene	10	U	20	U	19	U	10	U	10	U

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

0011

9613401.1417

9613401.1418

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: A042611

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 04/06/93

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 04/26/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

9613401.1419

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: A042611

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 04/06/93

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 04/26/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO..	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	1	JB
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	0.7	JB
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

9613401.1420

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: A042611

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 04/06/93

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 04/26/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	24.62	2	J
2.	UNKNOWN	27.26	10	JB

WESTON MANAGERS DESIGNERS/CONSULTANTS

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: WESTINGHOUSE HANFORD
RFW #: 9304L088

W.O. #: 06168-002-001-9999-00
Date Received: 04-02-93

PESTICIDE/PCB

One (1) water sample was collected on 03-31-93.

The sample and its associated QC samples were extracted on 04-05-93 and analyzed according to criteria set forth in the Contract Laboratory Program 03/90 SOW for Pesticide and PCB target compounds on 04-29-93.

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

1. Linearity and breakdown criteria were met for each of the analytical columns.

2. Retention time criteria were met for all compounds on both analytical columns.

3. Resolution of all pesticides in the Resolution Check Standard were within EPA QC limits.

4. The RPDs of the pesticides in the individual mixes analyzed for calibration verification were within 25% for both analytical columns.

5. The RPDs of the pesticides in the Performance Evaluation Mixes analyzed for calibration verification were within 25% for both analytical columns.

6. Two (2) of twenty-four (24) surrogate recoveries were outside EPA QC limits. The following surrogate recoveries were outside the EPA QC limits of 60% - 150%.

	% Recoveries			
Sample ID	TCX1	TCX2	DCB1	DCB2
93LE0476-MB1	-	-	45	45

7. Seven (7) of twenty-four (24) blank spike recoveries were outside EPA QC limits. The following blank spike recoveries were outside EPA QC limits:

Compound ID	% Recovery	QC Limits
Dieldrin	133	52 -126%
Endrin	175, 155, 143, 130	56 -121%
4,4'-DDT	148, 138	38 -127%

WESTON
MANAGERS DESIGNERS/CONSULTANTS

8. Five (5) of twenty-four (24) matrix spike recoveries were outside EPA QC limits. The following matrix spike recoveries were outside EPA QC limits:

Compound ID	% Recovery	QC Limits
Endrin	164, 142, 144, 126	56 -121%
4,4'-DDT	136	38 -127%

9. Recoveries of pesticides for the Florisil Cartridge Check were within EPA QC limits.

J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

05.10.93
Date

sma/pcb/04-088pp.cn

Roy F. Weston, Inc. - Lionville Laboratory
Pesticide/PCBs by GC, CLP List

RFW Batch Number: 9304L088 Client: WESTINGHOUSE HANFORD Work Order: 06168-002-001-9999-00 Report Date: 05/07/93 11:30 Page: 1

	Cust ID:	B088P6	B088P6	B088P6	B088P6	B088P6	B088P6
Sample Information	RFW#:	001	001	001 MS	001 MS	001 MSD	001 MSD
	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
			CONFIRM		CONFIRM		CONFIRM
Surrogate:	Tetrachloro-m-xylene	90 %	90 %	85 %	90 %	80 %	85 %
Surrogate:	Decachlorobiphenyl	90 %	85 %	95 %	90 %	90 %	85 %
		fl	fl	fl	fl	fl	fl
Alpha-BHC		0.050 U	NA	0.10 U	NA	0.050 U	NA
Beta-BHC		0.050 U	NA	0.10 U	NA	0.050 U	NA
Delta-BHC		0.050 U	NA	0.10 U	NA	0.050 U	NA
gamma-BHC (Lindane)		0.050 U	NA	104 %	98 %	96 %	92 %
Heptachlor		0.050 U	NA	102 %	88 %	94 %	86 %
Aldrin		0.050 U	NA	68 %	96 %	68 %	94 %
Heptachlor epoxide		0.050 U	NA	0.10 U	NA	0.050 U	NA
Endosulfan I		0.050 U	NA	0.10 U	NA	0.050 U	NA
Dieldrin		0.10 U	NA	125 %	114 %	114 %	105 %
4,4'-DDE		0.10 U	NA	0.20 U	NA	0.10 U	NA
Endrin		0.10 U	NA	164 * %	142 * %	144 * %	126 * %
Endosulfan II		0.10 U	NA	0.20 U	NA	0.10 U	NA
4,4'-DDD		0.10 U	NA	0.20 U	NA	0.10 U	NA
Endosulfan sulfate		0.090 JB	0.10 U	0.18 JB	0.20 U	0.080 JB	0.10 U
4,4'-DDT		0.10 U	NA	136 * %	123 %	120 %	112 %
Methoxychlor		0.50 U	NA	1.0 U	NA	0.50 U	NA
Endrin ketone		0.10 U	NA	0.20 U	NA	0.10 U	NA
Endrin aldehyde		0.10 U	NA	0.20 U	NA	0.10 U	NA
alpha-Chlordane		0.050 U	NA	0.10 U	NA	0.050 U	NA
gamma-Chlordane		0.050 U	NA	0.10 U	NA	0.050 U	NA
Toxaphene		5.0 U	NA	10 U	NA	5.0 U	NA
Aroclor-1016		1.0 U	NA	2.0 U	NA	1.0 U	NA
Aroclor-1221		2.0 U	NA	4.0 U	NA	2.0 U	NA
Aroclor-1232		1.0 U	NA	2.0 U	NA	1.0 U	NA
Aroclor-1242		1.0 U	NA	2.0 U	NA	1.0 U	NA
Aroclor-1248		1.0 U	NA	2.0 U	NA	1.0 U	NA
Aroclor-1254		1.0 U	NA	2.0 U	NA	1.0 U	NA
Aroclor-1260		1.0 U	NA	2.0 U	NA	1.0 U	NA

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

9613401.1423

9613404.1424

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 06168-002-001-9999-00

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 04279335.41

% Moisture: decanted: (Y/N)_

Date Received: 04/02/93

Extraction: (SepF/Cont/Sonc) CONT

Date Extracted: 04/05/93

Concentrated Extract Volume: 10000.00(uL)

Date Analyzed: 04/29/93

Injection Volume: .5 u(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

Sulfur Cleanup: (Y/N) N

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
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

FORM 1 PEST 03/90

D.O. 5/3/93

0024

9613401.1425

WESTON

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

MAY 1993 RECEIVED SDLA

Client : WESTINGHOUSE HANFORD
RFW# : 9304L088

W.O. #: 06168-002-001-9999-00
Date Received: 04-02-93

INORGANIC

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 with the exception of pH and Specific Conductance which were received past hold.

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

3. All laboratory control standards (blank spikes) were within the control limits of 80-120% (70-130% for Total Organic Halides). All %RPD were within the 20% guidance limit (40% for Total Organic Halides).

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

5. Matrix spike recoveries are summarized on the Inorganic Accuracy Report contained within this document. All recoveries were within the 75-125% guidance limits. (70-130% Total Organic Halides). All %RPD were within the 20% guidance limit.

6. Replicate results are summarized on the Inorganic Precision Report contained within this document. All results were within the 20% RPD guidance limit (40% for Total Organic Halides).

7. 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), Standard Methods for the Examination of Water and Wastewater 16 ed. and Test Methods for Evaluating Solid Waste (USEPA SW846).

RECORD COPY

for

J. Peter Hershey, Ph.D.
Laboratory Manager
Lionville Analytical Laboratory

4.26.93
Date

mmz/i04-088

9613401.1426

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 04/23/93

CLIENT: WESTINGHOUSE HANFORD

WESTON BATCH #: 9304L088

WORK ORDER: 06168-002-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	B088P6	Alkalinity	136		MG/L	2.0
		Chloride by IC	7.1		MG/L	0.25
		Fluoride by IC	0.50	u	MG/L	0.50
		Cyanide, Total	20.0	u	UG/L	20.0
		Chemical Oxygen Demand	5.0	u	MG/L	5.0
		Phosphate by IC	0.25	u	MG/L	0.25
		Sulfate by IC	24.6		MG/L	1.2
		Nitrate Nitrite	3.2		MG-N/L	1.0
		Ammonia, as N	0.10	u	MG/L	0.10
		Total Organic Carbon	1.1		MG/L	0.50
		pH	7.6		PH UNITS	0.010
		Sulfide	0.10	u	MG/L	0.10
		Specific Conductance	355		UMHOS/CM	1.0
		Total Dissolved Solids	247		MG/L	5.0
		Total Organic Halides	38.6		UG/L	20.0

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: WESTINGHOUSE HANFORD
RFW #: 9304L088

W.O. #: 06168-002-001-9999-00
Date Received: 04-02-93

CLP METALS

1. This narrative covers the analysis of (2) water samples.

2. The samples were prepared and analyzed in accordance with the following protocols: CLP SOW 3/90.

3. ICVs, CCVs, and LCSs stock standards were purchased form Inorganic Ventures Laboratory.

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

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

6. All Initial and Continuing Calibration Blanks (ICB/CCB's) were within control limits.

7. All Preparation/Method Blanks were below Reporting Limits.

8. All ICP Interference Check Samples (ICSA and ICSAB) were within control limits.

9. All Laboratory Control Samples (LCS) were within the 80-120% control limits.

10. All Serial Dilution percent differences were within USEPA SOW control limits.

11. All Matrix Spike recoveries were within the 75-125% control limits (exception allowed when sample concentration exceeds the spike added concentration by a factor of 4 or more)
except for:

RFW #	Element	%Recovery
001	As	74.3

A Post-Matrix Spike analysis was performed for those ICP elements that did not meet the specified control limits (exception allowed for Ag).

Matrix spike analyses are not required for Ca, Mg, Na, and K in waters.

WESTON
MANAGERS DESIGNERS/CONSULTANTS

12. All Duplicate analyses were within the 20% Relative Percent Difference (RPD) control limits for samples values greater than 5X Reporting Limit, or +/- the Reporting Limits for sample values less than 5X Reporting Limit.

13. Method of Standard Additions (MSA) analyses were not required.

14. The code CV is currently in use by the laboratory for both mercury instruments in operation (HG1 and HG2). HG1 is complete with autosampler and software, but still requires manual digestion; HG2 is operated by the analyst, produces a strip chart and also requires manual digestion.

15. HG1 requires less total volume of digestate due to the autosampler analysis. Sample volumes and reagents for mercury determinations in water and soil have been proportionally scaled down to adapt to this semi-automated technique. The sample volume used for water analysis is 33 ml. For soils, 0.1 gram of sample is taken to a final volume of 50 ml (including all reagents).

16. ICP Interelement Correction Factors for IC1 and IC3 are included in this package, but do not appear on EDD.

17. The graphite furnace time that appears on form XIV is the time of the first injection. The time that appears on the data is the print time.

Raymond A. Siery
Inorganic Section Manager
Lionville Analytical Laboratory

4.27.93
Date

rls/clp-met.nar

9613401.1429

ROY F. WESTON, INC.
LIONVILLE ANALYTICAL LABORATORY
ANALYTICAL CASE NARRATIVE

Client: WESTINGHOUSE HANFORD
RFW #: 9304L088

W.O. #: 06168-002-001-9999-00
Date Received: 04-02-93

CLP METALS ADDENDUM

1. Following Exhibit E, Section V, Item 10, page E-23 of the USEPA Statement of Work for Inorganics Analysis, Document Number ILM02.0 ICP Instrument Detection Limits (IDLs) are reported for two (2) ICP instruments. The instrument identification numbers are "IC1" and "IC3". The highest IDL for the two instruments is used for reporting concentration values in this sample data package.

2. A discrepancy exists between raw data and Form XIVs analytical spikes recovery calculations performed for graphite furnace AA analytes. Instrument software calculates spike recoveries based on absolute values below the IDL for sample results. This is hard-coded by the vendor and is currently not correctable. CLP convention (SOW ILM02.0, Exhibit E, Section V, Item 6, page E-20) requires that when values fall below the IDL, the sample result is equal to zero (0) for the purposes of calculating the percent recovery. The Form XIVs contain the correct calculation.

Raymond A. Siery
Inorganic Section Manager
Lionville Analytical Laboratory

4.27.93
Date

mlj\clp-met.nar

9613401.1430

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 04/23/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9304L088

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	B088P6	Silver, Total	10.0	u	UG/L	10.0
		Aluminum, Total	200	u	UG/L	200
		Arsenic, Total	10.0	u	UG/L	10.0
		Barium, Total	200	u	UG/L	200
		Beryllium, Total	5.0	u	UG/L	5.0
		Calcium, Total	41400		UG/L	5000
		Cadmium, Total	5.0	u	UG/L	5.0
		Cobalt, Total	50.0	u	UG/L	50.0
		Chromium, Total	10.0	u	UG/L	10.0
		Copper, Total	25.0	u	UG/L	25.0
		Iron, Total	100	u	UG/L	100
		Mercury, Total	0.20	u	UG/L	0.20
		Potassium, Total	5160		UG/L	5000
		Magnesium, Total	9700		UG/L	5000
		Manganese, Total	15.0	u	UG/L	15.0
		Sodium, Total	16100		UG/L	5000
		Nickel, Total	40.0	u	UG/L	40.0
		Lead, Total	3.0	u	UG/L	3.0
		Antimony, Total	60.0	u	UG/L	60.0
		Selenium, Total	5.0	u	UG/L	5.0
		Thallium, Total	10.0	u	UG/L	10.0
		Vanadium, Total	50.0	u	UG/L	50.0
		Zinc, Total	46.6		UG/L	20.0

9613401.1431

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 04/23/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9304L088

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-002	B088P7	Silver, Soluble	10.0	u	UG/L	10.0
		Aluminum, Soluble	200	u	UG/L	200
		Arsenic, Soluble	10.0	u	UG/L	10.0
		Barium, Soluble	200	u	UG/L	200
		Beryllium, Soluble	5.0	u	UG/L	5.0
		Calcium, Soluble	41000		UG/L	5000
		Cadmium, Soluble	5.0	u	UG/L	5.0
		Cobalt, Soluble	50.0	u	UG/L	50.0
		Chromium, Soluble	10.0	u	UG/L	10.0
		Copper, Soluble	25.0	u	UG/L	25.0
		Iron, Soluble	100	u	UG/L	100
		Mercury, Soluble	0.20	u	UG/L	0.20
		Potassium, Soluble	5000	u	UG/L	5000
		Magnesium, Soluble	9550		UG/L	5000
		Manganese, Soluble	15.0	u	UG/L	15.0
		Sodium, Soluble	15800		UG/L	5000
		Nickel, Soluble	40.0	u	UG/L	40.0
		Lead, Soluble	3.0	u	UG/L	3.0
		Antimony, Soluble	60.0	u	UG/L	60.0
		Selenium, Soluble	5.0	u	UG/L	5.0
		Thallium, Soluble	10.0	u	UG/L	10.0
		Vanadium, Soluble	50.0	u	UG/L	50.0
		Zinc, Soluble	85.5		UG/L	20.0

9613401.1432

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B088P6

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP088

Matrix (soil/water): WATER Lab Sample ID: 930408801

Level (low/med): LOW Date Received: 4/02/93

% 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	59.00	U		P
7440-36-0	Antimony	40.00	U		P
7440-38-2	Arsenic	5.60	B	N	F
7440-39-3	Barium	25.80	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	5.00	U		P
7440-70-2	Calcium	41400.00			P
7440-47-3	Chromium	7.00	B		P
7440-48-4	Cobalt	6.00	U		P
7440-50-8	Copper	10.00	U		P
7439-89-6	Iron	81.00	B		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	9700.00			P
7439-96-5	Manganese	4.10	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	21.00	U		P
7440-09-7	Potassium	5160.00			P
7782-49-2	Selenium	2.00	U	W	F
7440-22-4	Silver	9.00	U		P
7440-23-5	Sodium	16100.00			P
7440-28-0	Thallium	5.00	U		F
7440-62-2	Vanadium	16.80	B		P
7440-66-6	Zinc	46.60			P
	Cyanide	20.00	U		C

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613401.1433

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B088P7

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP088

Matrix (soil/water): WATER Lab Sample ID: 930408802

Level (low/med): LOW Date Received: 4/02/93

% 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	59.00	U		P
7440-36-0	Antimony	40.00	U		P
7440-38-2	Arsenic	3.70	B	N	F
7440-39-3	Barium	24.50	B		P
7440-41-7	Beryllium	1.00	U		P
7440-43-9	Cadmium	5.00	U		P
7440-70-2	Calcium	41000.00			P
7440-47-3	Chromium	6.00	U		P
7440-48-4	Cobalt	6.00	U		P
7440-50-8	Copper	10.00	U		P
7439-89-6	Iron	38.30	B		P
7439-92-1	Lead	2.00	U		F
7439-95-4	Magnesium	9550.00			P
7439-96-5	Manganese	4.10	B		P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	21.00	U		P
7440-09-7	Potassium	4240.00	B		P
7782-49-2	Selenium	2.00	U	W	F
7440-22-4	Silver	9.00	U		P
7440-23-5	Sodium	15800.00			P
7440-28-0	Thallium	5.00	U		F
7440-62-2	Vanadium	9.10	B		P
7440-66-6	Zinc	85.50			P
	Cyanide				NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

9613401.1434

VALIDATION SUMMARY

9613401.1435 9304LG88-WES-1128

Kearney/Centaur Division
A.T. Kearney, Inc.
2952 George Washington Way
Richland, Washington 99352
509 375 5667
Facsimile 509 375 5151

Management
Consultants

ATKEARNEY

August 5, 1993

Ms. Jeanette Duncan
Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352

Reference: Purchase Order No. 272980; Task Order KD-93-17, Validation of 100 Area Data, Validation Report Submittal.

Internal: A.T. Kearney Project Number G954-17

Dear Ms. Duncan:

Enclosed are two copies of the following data validation report:

- WHC-SD-EN-TI-187 100-FR-3, Second Round Groundwater Samples

Please feel free to contact me at (415) 595-4300 if you have any questions

Sincerely

Patricia M Brownbracher
for John W. Goode, Ph.D
Task Order Manager

cc. R. Henckel, WHC
K. Pool, WHC
M. Schwab, WHC
J. Koehnen
L. Sherman
J. Darabaris
H. Duncan

AUG 1993
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AUG 5 1993
VALIDATION DOCUMENTATION
CDLA

9473401 1436

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: B040508

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: not dec.

Date Analyzed: 04/05/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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	10 ~~1~~	~~JB~~ U
67-64-1	Acetone	10	U
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	9	J
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	3	J
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

DEW 7/19/93

9304L 1437

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-001

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: B040508

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: not dec.

Date Analyzed: 04/05/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

FORM 1 VOA-TIC 3/90

DFW 7/19/93

9413401 1439

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B088P8

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: B040509

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: not dec.

Date Analyzed: 04/05/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

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	JB
67-64-1	Acetone	14	B
75-15-0	Carbon Disulfide	10	U
75-35-4	1,1-Dichloroethene	10	U
75-34-3	1,1-Dichloroethane	10	U
540-59-0	1,2-Dichloroethene (total)	10	U
67-66-3	Chloroform	10	U
107-06-2	1,2-Dichloroethane	10	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	10	U
56-23-5	Carbon Tetrachloride	10	U
75-27-4	Bromodichloromethane	10	U
78-87-5	1,2-Dichloropropane	10	U
10061-01-5	cis-1,3-Dichloropropene	10	U
79-01-6	Trichloroethene	10	U
124-48-1	Dibromochloromethane	10	U
79-00-5	1,1,2-Trichloroethane	10	U
71-43-2	Benzene	10	U
10061-02-6	trans-1,3-Dichloropropene	10	U
75-25-2	Bromoform	10	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	10	U
79-34-5	1,1,2,2-Tetrachloroethane	10	U
108-88-3	Toluene	10	U
108-90-7	Chlorobenzene	10	U
100-41-4	Ethylbenzene	10	U
100-42-5	Styrene	10	U
1330-20-7	Xylene (total)	10	U

RBJ 8/3/93

0032

DEW 7/19/93

9413401 1439

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B088P8

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-003

Sample wt/vol: 5.00 (g/mL) ML

Lab File ID: B040509

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: not dec.

Date Analyzed: 04/05/93

GC Column: DB624 ID: .53(mm)

Dilution Factor: 1.00

Soil Extract Volume: (uL)

Soil Aliquot Volume: (uL)

Number TICs found: 0

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.				

DEW
7/19/93

9613401.1440

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: A042611

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 04/06/93

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 04/26/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

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
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	2,2'-oxybis(1-Chloropropane)	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
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	25	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	25	U
131-11-3	Dimethylphthalate	10	U
208-96-8	Acenaphthylene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
99-09-2	3-Nitroaniline	25	U
83-32-9	Acenaphthene	10	U

DKW 7/20/93

9613401.1441

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER Lab Sample ID: 9304L088-001

Sample wt/vol: 1000 (g/mL) ML Lab File ID: A042611

Level: (low/med) LOW Date Received: 04/02/93

% Moisture: _____ decanted: (Y/N)__ Date Extracted: 04/06/93

Concentrated Extract Volume: 1000(uL) Date Analyzed: 04/26/93

Injection Volume: 2.0(uL) Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

CAS NO..	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) ug/L	Q
51-28-5	2,4-Dinitrophenol	25	U
100-02-7	4-Nitrophenol	25	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-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	25	U
534-52-1	4,6-Dinitro-2-methylphenol	25	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	25	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
86-74-8	Carbazole	10	U
84-74-2	Di-n-butylphthalate	10 ~~1~~	~~JB~~ 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	10	U
56-55-3	Benzo(a)anthracene	10	U
218-01-9	Chrysene	10	U
117-81-7	bis(2-Ethylhexyl)phthalate	10 ~~0.7~~	~~JB~~ 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

FORM 1 SV-2 3/90

DKW 7/20/93

0027

9613401.1442

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-0

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: A042611

Level: (low/med) LOW

Date Received: 04/02/93

% Moisture: _____ decanted: (Y/N)__

Date Extracted: 04/06/93

Concentrated Extract Volume: 1000(uL)

Date Analyzed: 04/26/93

Injection Volume: 2.0(uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N

pH: 7.0

Number TICs found: 2

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

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	UNKNOWN	24.62	2	J
2.	UNKNOWN	27.26	10	~~JB~~ U

FORM 1 SV-TIC

DEW 7/20/93

3/90

0028

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1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

CLIENT SAMPLE NO.

B088P6

Lab Name: Roy F. Weston, Inc. Work Order: 06168-002-001-9999-00

Client: WESTINGHOUSE HANFORD

Matrix: (soil/water) WATER

Lab Sample ID: 9304L088-001

Sample wt/vol: 1000 (g/mL) ML

Lab File ID: 04279335.41

% Moisture: decanted: (Y/N)_

Date Received: 04/02/93

Extraction: (SepF/Cont/Sonc) CONT

Date Extracted: 04/05/93

Concentrated Extract Volume: 10000.00 (uL)

Date Analyzed: 04/29/93

Injection Volume: .5 u (uL)

Dilution Factor: 1.00

GPC Cleanup: (Y/N) N pH: 7.0

Sulfur Cleanup: (Y/N) N

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
7421-93-4	Endrin aldehyde	0.10	U
5103-71-9	alpha-Chlordane	0.050	U
5103-74-2	gamma-Chlordane	0.050	U
8001-35-2	Toxaphene	5.0	U
12674-11-2	Aroclor-1016	1.0	U
11104-28-2	Aroclor-1221	2.0	U
11141-16-5	Aroclor-1232	1.0	U
53469-21-9	Aroclor-1242	1.0	U
12672-29-6	Aroclor-1248	1.0	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

FORM 1 PEST 03/90

D.O. 5/3/93

DKW 7/20/93

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9613401.1444

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B088P6

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP088

Matrix (soil/water): WATER Lab Sample ID: 930408801

Level (low/med): LOW Date Received: 4/02/93

% 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	59.0Ø	U			P
7440-36-0	Antimony	40.0Ø	U			P
7440-38-2	Arsenic	5.6Ø	B	N	UJ	F
7440-39-3	Barium	25.8Ø	B			P
7440-41-7	Beryllium	1.0Ø	U			P
7440-43-9	Cadmium	5.0Ø	U			P
7440-70-2	Calcium	41400.ØØ				P
7440-47-3	Chromium	7.0Ø	B			P
7440-48-4	Cobalt	6.0Ø	U			P
7440-50-8	Copper	10.0Ø	U			P
7439-89-6	Iron	81.0Ø	B		U	P
7439-92-1	Lead	2.0Ø	U			F
7439-95-4	Magnesium	9700.ØØ				P
7439-96-5	Manganese	4.1Ø	B			P
7439-97-6	Mercury	.10	U			CV
7440-02-0	Nickel	21.0Ø	U			P
7440-09-7	Potassium	5160.ØØ				P
7782-49-2	Selenium	2.0Ø	U	W	J	F
7440-22-4	Silver	9.0Ø	U			P
7440-23-5	Sodium	16100.ØØ				P
7440-28-0	Thallium	5.0Ø	U			F
7440-62-2	Vanadium	16.8Ø	B		U	P
7440-66-6	Zinc	46.6Ø			U	P
	Cyanide	20.0Ø	U			C

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN DKW 7/20/93 03/90

0030

9613401.1445

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

B088P7

Lab Name: ROY F. WESTON, INC - L372 Contract: 6168-02-01

Lab Code: WESTON Case No.: WEST SAS No.: SDG No.: CLP088

Matrix (soil/water): WATER Lab Sample ID: 930408802

Level (low/med): LOW Date Received: 4/02/93

% 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	59.0	U			P
7440-36-0	Antimony	40.0	U			P
7440-38-2	Arsenic	3.7	B	N	UJ	F
7440-39-3	Barium	24.5	B			P
7440-41-7	Beryllium	1.0	U			P
7440-43-9	Cadmium	5.0	U			P
7440-70-2	Calcium	41000.0				P
7440-47-3	Chromium	6.0	U			P
7440-48-4	Cobalt	6.0	U			P
7440-50-8	Copper	10.0	U			P
7439-89-6	Iron	38.3	B		U	P
7439-92-1	Lead	2.0	U			F
7439-95-4	Magnesium	9550.0				P
7439-96-5	Manganese	4.1	B			P
7439-97-6	Mercury	.10	U			CV
7440-02-0	Nickel	21.0	U			P
7440-09-7	Potassium	4240.0	B			P
7782-49-2	Selenium	2.0	U	W	J	F
7440-22-4	Silver	9.0	U			P
7440-23-5	Sodium	15800.0				P
7440-28-0	Thallium	5.0	U			F
7440-62-2	Vanadium	9.1	B		U	P
7440-66-6	Zinc	85.5				P
	Cyanide					NR

Color Before: COLORLESS Clarity Before: CLEAR Texture:

Color After: COLORLESS Clarity After: CLEAR Artifacts:

Comments:

FORM I - IN DEW 7/20/93 03/90

0031

9613401.1446

ROY F. WESTON INC.

INORGANIC DATA SUMMARY REPORT 04/23/93

CLIENT: WESTINGHOUSE HANFORD
WORK ORDER: 06168-002-001-9999-00

WESTON BATCH #: 9304L088

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	B088P6	Alkalinity	136	R	MG/L	2.0
		Chloride by IC	7.1		MG/L	0.25
		Fluoride by IC	0.50	u	MG/L	0.50
		~~Cyanide, Total~~	~~20.0~~	~~u~~	~~UG/L~~	~~20.0~~
		Chemical Oxygen Demand	5.0	u	MG/L	5.0
		Phosphate by IC	0.25	uJ	MG/L	0.25
		Sulfate by IC	24.6		MG/L	1.2
		Nitrate Nitrite	3.2		MG-N/L	1.0
		Ammonia, as N	0.10	u	MG/L	0.10
		Total Organic Carbon	1.1		MG/L	0.50
		pH	7.6		PH UNITS	0.010
		Sulfide	0.10	u	MG/L	0.10
		Specific Conductance	355		UMHOS/CM	1.0
		Total Dissolved Solids	247		MG/L	5.0
		Total Organic Halides	38.6	R	UG/L	20.0

DKW
7/2/93

0004

Validation Reports 100-FR-3

DATA VALIDATION REPORT FOR THE 100-FR-3 OPERABLE UNIT SECOND ROUND SAMPLING

Submitted To:

Westinghouse Hanford Company
P.O. Box 1970
2355 Stevens Drive
Richland, WA 99352

Submitted By:

A.T. Kearney, Inc.
2952 George Washington Way
Richland, WA 99352

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SDLA

In Response To:

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Task Order K-93-17

Document Control Number
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TQO

August 1993

DISCLAIMER

This report is designated as Revision 0. The report covers a specific site for a specific sampling time frame. The report addresses only those samples that have been provided for data validation review.

At the request of Westinghouse Hanford Company (Westinghouse-Hanford), a minimum of 20% of the total number of Sample Delivery Groups received by A.T. Kearney, Inc. from the 100-FR-3 Operable Unit Second Round Sampling Remedial Investigation and their related quality assurance samples were reviewed and validated to verify that reported sample results were of sufficient quality to meet quality control objectives. With the consent of Westinghouse-Hanford, Sample Delivery Groups were chosen by A.T. Kearney, Inc. randomly, but reflect the overall character of samples within the unit. Findings are, however, insufficient to allow for extrapolation of these validation results to other unvalidated samples of Sample Delivery Groups within the 100-FR-3 Operable Unit.

ACRONYMS

%D	Percent difference
AA	Atomic absorption
BFB	Bromofluorobenzene
BNA	Base/neutral and acid (equivalent to semivolatiles)
CCV	Continuing calibration verification
CLP	Contract Laboratory Program
CRDL	Contract required detection limit
CRQL	Contract required quantitation limit
DBC	Dibutylchlorendate
DFTPP	Decafluorotriphenylphosphine
DQO	Data quality objectives
EPA	U.S. Environmental Protection Agency
GC/MS	Gas chromatography/mass spectrometry
GC	Gas chromatography
GFAA	Graphite furnace atomic absorption
GPC	Gel permeation chromatography
ICP	Inductively coupled plasma emission spectrometry
ICS	ICP interference check sample
ICV	Initial calibration verification
IDL	Instrument detection limit
MSA	Method of standard addition
MS/MSD	Matrix spike/matrix spike duplicate
PCB	Polychlorinated biphenyl
PEM	Performance evaluation mixture
QA	Quality assurance
QC	Quality control
RF	Response factor
RIC	Reconstructed ion chromatogram
RPD	Relative percent difference
RRF	Relative response factor
RRT	Relative retention time
RSD	Relative standard deviation
RT	Retention time
SDG	Sample delivery group
SOW	Statement of work
TAL	Target analyte list
TCL	Target compound list
TIC	Tentatively identified compounds
TOC	Total organic carbon
TOX	Total organic halides
VOC	Volatile organic compounds

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1.0 INTRODUCTION

The following samples were obtained from the 100-FR-3 Operable Unit Second Round Sampling event:

B088P6	B088S6	B088W1	B088Y6	B08911
B088P7	B088S7	B088W2	B088Y7	B08912
B088P8	B088S8	B088W3	B088Y8	B08913
B088P9	B088S9	B088W4	B088Y9	B08914
B088Q0	B088T0	B088W5	B088Z0	B08915
B088Q1	B088T1	B088W6	B088Z1	B08916
B088Q2	B088T2	B088W7	B088Z2	B08917
B088Q3	B088T3	B088W8	B088Z3	B08918
B088Q4	B088T4	B088W9	B088Z4	B08919
B088Q5	B088T5	B088X0	B088Z5	B08920
B088Q6	B088T6	B088X1	B088Z6	B08921
B088Q7	B088T7	B088X2	B088Z7	B08922
B088Q8	B088T8	B088X3	B088Z8	B08923
B088Q9	B088T9	B088X4	B088Z9	B08924
B088R0	B088V0	B088X5	B08900	B08925
B088R1	B088V1	B088X6	B08901	B08926
B088R2	B088V2	B088X7	B08902	B08927
B088R3	B088V3	B088X8	B08903	B08928
B088R4	B088V4	B088X9	B08904	B08929
B088R5	B088V5	B088Y0	B08905	B08930
B088R6	B088V6	B088Y1	B08906	B08931
B088R7	B088V7	B088Y2	B08907	B08932
B088R8	B088V8	B088Y3	B08908	B08933
B088R9	B088V9	B088Y4	B08909	B08934
B088S5	B088W0	B088Y5	B08910	B08935

Westinghouse-Hanford has requested that a minimum of 20% of the total number of Sample Delivery Groups be validated for the 100-FR-3 Operable Unit Second Round Sampling Remedial Investigation. Therefore, the data from the chemical analysis of 38 samples from this sampling event and their related quality assurance samples were reviewed and validated to verify that reported sample results were of sufficient quality to support decisions regarding remedial actions performed at this site. The samples were analyzed by Thermo-Analytic Laboratories (TMA) and Roy F. Weston Laboratories (WESTON) using U.S. Environmental Protection Agency (EPA) CLP protocols.

Sample analyses included:

- Volatile organics
- Semivolatile organics
- Pesticide/PCB organics
- Inorganics
- General chemical parameters.

The table below lists the Sample Delivery Groups (SDGs) that were validated for this sampling event. The validated data and the non-validated results for the remaining samples are included in this report.

SDG Package No.	Matrix	No. of Samples Analyzed	Parameters
B088P6	W	2	VOC, Inorganics
B088P6	W	1	BNA, Pest/PCB, Wet Chemistry
B088P9	W	9	Hydrazine
B088Q3	W	8	TOC/TOX
B088Q5	W	8	VOC, Inorganics
B088Q5	W	4	BNA, Pest/PCB, Wet Chemistry
B088Z5	W	4	VOC, Inorganics
B088Z5	W	2	BNA, Pest/PCB, Wet Chemistry

Twenty-five samples were analyzed and submitted for validation for radiochemical parameters by TMA and Teledyne. Analytical protocols specified in the *Westinghouse Hanford Company Statement of Work for Nonradioactive Inorganic/Organic and Radiochemical Analytical Services* were used. Sample analyses included the following:

- Gross alpha and gross beta determination
- Alpha spectroscopy
- Gamma spectroscopy
- Strontium-90
- Technetium-99
- Carbon-14
- Tritium.

SDG Package No.	Matrix	No. of Samples Analyzed	Parameters
B088P6	W	1	Radiochemistry
B088Q0	W	13	Radiochemistry
B088R0	W	10	Radiochemistry
B08930	W	1	Radiochemistry

The radiochemical data summary tables can be found following Section 13.8.

Data quality was reviewed and analytical results validated using Westinghouse-Hanford procedures and related EPA CLP protocols and guidelines. Data were qualified based upon their quality and the guidance provided by these sources. In instances where the two protocols differed, the Westinghouse-Hanford guidance was followed.

Two sets of split samples were submitted to TMA and Roy F. Weston Laboratories as shown below:

Set 1:

Sample No.	Split Sample No.	Well Location
B088V5, B088V8	B088P6	199-F5-45
B088V6	B088P7	199-F5-45
B088V7	B088P8	199-F5-45
B088V9	B088P9	199-F5-45

Set 2:

Sample No.	Split Sample No.	Well Location
B088W5, B088W8	B08930	199-F5-47
B088W6	B08931	199-F5-47
B088W7	B08932	199-F5-47
B088W9	B08933	199-F5-47

The sample and split sample results for well 199-F5-45 were included in the validated data. The results were compared using the sample guidelines for determining the RPD between a sample and its duplicate. All results fell within the required control limits. All results for both well locations appear in the summary tables within this report.

Two sets of field duplicate samples were submitted to TMA as shown below.

Set 1:

Sample No.	Duplicate Sample No.	Well Location
B088V5	B08910	199-F5-45
B088V6	B08911	199-F5-45
B088V7	B08912	199-F5-45
B088V8	B08913	199-F5-45
B088V9	B08914	199-F5-45

Set 2:

Sample No.	Duplicate Sample No.	Well Location
B088W5	B08915	199-F5-47
B088W6	B08916	199-F5-47
B088W7	B08917	199-F5-47
B088W8	B08918	199-F5-47
B088W9	B08919	199-F5-47

The duplicate sample results for well 199-F5-45 were included in the validated data. The results were compared using the sample guidelines for determining the RPD between a sample and its duplicate. All results fell within the required control limit. All results for both well locations appear in the summary tables within this report.

Two sets of equipment blanks were submitted to TMA as shown in the table below. The first set was collected on 4/12/93 and designated EB 1. The second set was collected on 4/13/93 and designated EB 2.

Set 1 (EB 1): Sample Number	Set 2 (EB 2): Sample Number
B08920	B08925
B08921	B08926
B08922	B08927
B08923	B08928
B08924	B08929

Under EPA protocol, equipment blanks are water samples used to indicate whether or not decontamination procedures were adequate or that contamination was not inherent in the equipment used. The equipment blank information provided was inadequate to determine what contamination, if any, was a result of the equipment used. Equipment blanks require well number locations and associated sample numbers in order to make such a determination.

The report is broken down into sections for each chemical analysis and radiochemical analysis type. Each section addresses the data package completeness, holding time adherence, instrument calibration and tuning acceptability, blank results, accuracy, precision, system performance, as well as the compound identification and quantitation. In addition, each section has an overall assessment and summary for the data packages reviewed for the particular chemical/radiochemical analyses. Detailed backup information is provided to the reader by SDG No. and sample number. For each data package, a matrix of chemical analysis per sample number is presented, as well as data qualification summaries.

Laboratory and data validation personnel added qualifiers to the reported data based on specified data quality objectives. The data reporting qualifiers are summarized as follows:

U - Indicates the analyte was analyzed for and not detected. The value reported is the sample quantitation limit corrected for dilutions and moisture content. It should be noted that the sample quantitation limit may be higher or lower than the contract or method required detection limit, depending on instrumentation, matrix and concentration factors.

J - Indicates the analyte was analyzed for and detected. However, the associated value is considered to be an estimate due to identified QC deficiencies. Data flagged with a "J" may be usable for decision making purposes, depending upon the DQOs of the project. Laboratories qualify all reported organic detects below CRQL with a "J" per the CLP procedures.

UJ - Indicates the analyte was analyzed for and not detected. However, the associated detection limit is considered to be an estimate due to identified QC deficiencies. Detection limits flagged with a "UJ" may be usable for decision making purposes, depending upon the DQOs of the project.

JN - Indicates the analyte was analyzed for and that there is presumptive evidence of the presence of the compound. The concentration reported is considered an estimate which should be used for informational purposes only.

E - Indicates the analyte was analyzed for and detected at a concentration outside of the calibration range of the instrument. All reported concentrations flagged with an "E" are estimates which may contain significant error.

R - Indicates the analyte was analyzed for and due to a significant QC deficiency, the data are deemed unusable. Analytic results flagged "R" are invalid and

provide no information as to whether or not the analyte is present.

The results of data validation performed for the 100-FR-3 Operable Unit Second Round Sampling Remedial Investigation are contained in the tables following each of the chapters in this report.

Several general quality trends which resulted in data qualification were observed. These included:

- Minor lab and trip blank contamination was noted in the volatile and semivolatile results for a few samples. The contaminants were compounds commonly found in analytical laboratories and the corresponding sample results were flagged accordingly.

- The holding time from extraction to analysis was exceeded, though not grossly, for one BNA sample. The associated results were flagged accordingly.

- All results for one Pest/PCB sample were rejected and flagged "R" due to zero percent surrogate recoveries on both columns.

- The metal analysis showed minor matrix spike accuracy problems, laboratory duplicate RPD results outside of QC and analytical spike recoveries below the QC limit. Approximately 5 percent of the metals results were flagged "J" due to these factors.

- Some laboratory blank contamination was noted in the inorganics analysis. Associated results were flagged accordingly. Contamination, however, was not sufficiently high to affect the usability of the data.

- The holding time from sample collection to preparation and analysis was exceeded for pH, phosphate, hydrazine and TDS in several wet chemistry data packages. Associated results were flagged accordingly.

- Sufficient initial and/or continuing calibration data for TOX, specific conductance, sulfide, ammonia-nitrogen, alkalinity and COD analyses were not provided or performed. Associated results were qualified as estimates.

- Due to low LCS recoveries, gross alpha results in several samples were flagged "J".

- Due to low chemical yields, the isotopic plutonium and americium-241 results in several samples were rejected and flagged "R".

- Due to low radiochemical yields, technetium-99 results in several samples were rejected and flagged "R".

- Due to slightly low LCS recovery results, carbon-14 sample results in several samples were qualified as estimates and flagged "J".

- Due to high LCS recovery results, carbon-14 sample results in several samples were rejected and flagged "R".

In general, the protocol-specific QA/QC requirements were met for the samples analyzed in this investigation with the exceptions noted above and discussed in detail in the chapters to follow. All requested analyses were performed.

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

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	VOLATILES
199-F5-45	B088P6	W	03/31/93	V	2-5
	B088P8	W	03/31/93	V	2-5
199-F1-2	B088Q0	W	04/02/93	NV	2-8
	B088Q2	W	04/02/93	NV	2-8
199-F5-1	B088Q5	W	03/31/93	V	2-9
	B088Q7	W	03/31/93	V	2-9
199-F5-3	B088R0	W	04/07/93	NV	2-12
	B088R2	W	04/07/93	NV	2-12
199-F5-4	B088R5	W	04/05/93	NV	2-13
	B088R7	W	04/05/93	NV	2-13
199-F5-6	B088S5	W	04/07/93	NV	2-12
	B088S7	W	04/07/93	NV	2-12
199-F5-42	B088T0	W	04/05/93	NV	2-13
	B088T2	W	04/05/93	NV	2-13
199-F5-43A	B088T5	W	04/06/93	NV	2-14
	B088T7	W	04/06/93	NV	2-14
199-F5-44	B088V0	W	04/01/93	NV	2-15
	B088V2	W	04/01/93	NV	2-15
199-F5-45	B088V5	W	03/31/93	V	2-9
	B088V7	W	03/31/93	V	2-9
199-F5-46	B088W0	W	04/03/93	NV	2-8
	B088W2	W	04/03/93	NV	2-8
199-F5-47	B088W5	W	04/07/93	NV	2-12
	B088W7	W	04/07/93	NV	2-12
199-F5-48	B088X0	W	04/03/93	NV	2-8
	B088X2	W	04/03/93	NV	2-8
199-F6-1	B088X5	W	04/06/93	NV	2-14
	B088X7	W	04/06/93	NV	2-14
199-F7-1	B088Y0	W	03/31/93	V	2-9
	B088Y2	W	03/31/93	V	2-9
199-F7-2	B088Y5	W	04/08/93	NV	2-16
	B088Y7	W	04/08/93	NV	2-16
199-F7-3	B088Z0	W	04/09/93	NV	2-17
	B088Z2	W	04/09/93	NV	2-17

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	VOLATILES
199-F8-2	B088Z5 B088Z7	W W	04/12/93 04/12/93	V V	2-18 2-18
199-F8-3	B08900 B08902	W W	04/03/93 04/03/93	NV NV	2-8 2-8
199-F8-4	B08905 B08907	W W	04/08/93 04/08/93	NV NV	2-16 2-16
199-F5-45	B08910 B08912	W W	03/31/93 03/31/93	V V	2-9 2-9
199-F5-47	B08915 B08917	W W	04/07/93 04/07/93	NV NV	2-12 2-12
EB 1	B08920 B08922	W W	04/12/93 04/12/93	V V	2-18 2-18
EB 2	B08925 B08927	W W	04/13/93 04/13/93	NV NV	2-19 2-19
199-F5-47	B08930 B08932	W W	04/07/93 04/07/93	NV NV	2-20 2-20
MB 1	B08934	W	04/08/93	NV	2-16
MB 2	B08935	W	04/08/93	NV	2-16

2.0 VOLATILE ORGANIC DATA VALIDATION

2.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6 B088Q5 B088Z5

2.2 HOLDING TIMES

Analytical holding times were assessed to ascertain whether the Westinghouse-Hanford holding time requirements for volatile organic analyses were met by the laboratory. The Westinghouse-Hanford holding time requirements for volatile organic analyses are as follows: soil samples must be analyzed within 14 days of the date of sample collection; aqueous samples must be analyzed within seven days of the date of sample collection (if unpreserved); and all samples must be shipped on ice to the laboratory and stored at 4°C until analysis.

Holding times were met for all samples.

2.3 INSTRUMENT CALIBRATION AND TUNING

Instrument calibration is performed to establish that the GC/MS instrument is capable of producing acceptable and reliable analytical data over a range of concentrations. The initial and continuing calibrations are to be performed according to CLP protocols. An initial multipoint calibration is performed prior to sample analysis to establish the linear range of the GC/MS instrument. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All initial and continuing calibration results were acceptable.

2.3.1 GC/MS Tuning/Instrument Performance Check

Tuning is performed to ensure that mass resolution, identification, and, to some degree, sensitivity of the GC/MS instrument have been established. When analyzing for volatile organics, instrument tuning is performed with BFB. Instrument tuning must be performed prior to the analysis of either standards or samples and must meet the criteria for acceptable

GC/MS instrument tuning using BFB as outlined in Westinghouse-Hanford (WHC 1991) and in EPA (EPA 1988a and 1988b) criteria.

The original data were checked for transcription and calculation errors to verify that tuning criteria were met. Prior to calibration and sample analysis, all tuning criteria were met.

All GC/MS tuning data were acceptable.

2.4 BLANKS

Method blank and field blank analyses are performed to determine the extent of laboratory or field contamination of samples. No contaminants should be present in the blanks. Analytical results for analytes present in any sample at less than 5 times the concentration of that analyte found in associated blanks should be qualified as non-detects; common laboratory contaminants present at less than 10 times the concentration of that analyte are qualified as non-detects.

Due to the presence of laboratory blank contamination, the following sample was flagged "U" for methylene chloride:

- Sample number B088P6 in SDG No. B088P6.

Due to the presence of trip blank contamination, the following sample was flagged "U" for acetone:

- Sample number B088Q5 in SDG No. B088Q5.

All other laboratory and field blank results were acceptable.

2.5 ACCURACY

Accuracy was assessed by evaluating the recoveries of stable isotopically labeled surrogate compounds added to all samples and blanks, and by the analysis of a representative sample which was spiked with a variety of volatile organic compounds.

2.5.1 Matrix Spike Recovery

Matrix spike compounds are added to a sample which is representative of the sample delivery group. Matrix spike analyses are performed in duplicate using five compounds and should be within the established quality control limits (EPA 1988b). The matrix spike analyses estimate how much the target compounds are interfered with, either positively or negatively, by the sample matrix.

All MS/MSD results were acceptable.

2.5.2 Surrogate Recovery

Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. When a surrogate compound recovery is out of the control window, all positively identified target compounds associated with the unacceptable surrogate recoveries are qualified as estimates (J). Undetected compounds are qualified as having an estimated detection limit (UJ).

All surrogate recovery results were acceptable.

2.6 PRECISION

Precision is expressed by the relative percent difference (RPD) between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Field precision is measured by analyzing duplicate samples taken in the field.

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

2.7 INTERNAL STANDARDS PERFORMANCE

Internal standard performance was assessed to determine whether abrupt changes in instrument response and sensitivity occurred that may have affected the reliability of the analytical data. The response (area or height) of the internal standards must not vary by more than 100 percent or -50 percent from the response of the internal standard that was used to calculate the upper and lower bounds. The upper and lower bounds define the range for acceptable internal standard response (area/height) for the sample analyses.

All internal standard recovery results were acceptable.

2.8 COMPOUND IDENTIFICATION AND QUANTITATION

The identity of detected compounds are confirmed to investigate the possibility of false positives. The confirmation of compound identification during the quality assurance review focuses on false positives because only mass spectra for positive identifications are submitted. However, target compounds that are reported as undetected are also evaluated to investigate the possibility of false negatives. Confirmation of possible false negatives is addressed by reviewing other factors relating to analytical sensitivity (e.g., relative response factors, detection limits, linearity, analytical recovery).

Compound quantitations and reported detection limits were recalculated for a minimum of 20 percent of the samples in each case to verify that they are accurate and are consistent with CLP requirements.

Below the CRQL, instrument precision becomes more variable as the instrument detection limit is approached. Therefore, the concentration of any compound that was detected below the CRQL was qualified as an estimate (J).

The reported results and quantitation limits were verified as correct in all cases.

2.9 OVERALL ASSESSMENT AND SUMMARY

A thorough review of ongoing data acquisition and instrument performance criteria was made to assess overall GC/MS instrument performance. No changes in instrument performance were noted that would result in the degradation of data quality. No indications of unacceptable instrument performance (i.e., shifts in baseline stability, retention time shifts, extraneous peaks, or sensitivity) were found during the quality assurance review.

In general, the volatile data presented in this report met the protocol-specified QA/QC requirements. Minor blank contamination was detected in two samples. The data are considered valid and usable within the standard error associated with the method. All results are considered to be acceptable and usable for all purposes.

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B088P6																				
Sample Number		B088P6		B088P8																	
Location		199-F5-45		199-F5-45																	
Remarks		Split		Split, TB																	
Sample Date		3/31/93		3/31/93																	
Analysis Date		4/05/93		4/05/93																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U																
Bromomethane	10	10	U	10	U																
Vinyl Chloride	10	10	U	10	U																
Chloroethane	10	10	U	10	U																
Methylene Chloride	10	10	U	5	J																
Acetone	10	10	U	14																	
Carbon Disulfide	10	10	U	10	U																
1,1-Dichloroethene	10	10	U	10	U																
1,1-Dichloroethane	10	10	U	10	U																
1,2-Dichloroethene (total)	10	10	U	10	U																
Chloroform	10	9	J	10	U																
1,2-Dichloroethane	10	10	U	10	U																
2-Butanone	10	10	U	10	U																
1,1,1-Trichloroethane	10	10	U	10	U																
Carbon Tetrachloride	10	10	U	10	U																
Bromodichloromethane	10	10	U	10	U																
1,2-Dichloropropane	10	10	U	10	U																
cis-1,3-Dichloropropene	10	10	U	10	U																
Trichloroethene	10	3	J	10	U																
Dibromochloromethane	10	10	U	10	U																
1,1,2-Trichloroethane	10	10	U	10	U																
Benzene	10	10	U	10	U																
trans-1,3-Dichloropropene	10	10	U	10	U																
Bromoform	10	10	U	10	U																
4-Methyl-2-pentanone	10	10	U	10	U																
2-Hexanone	10	10	U	10	U																
Tetrachloroethene	10	10	U	10	U																
1,1,2,2-Tetrachloroethane	10	10	U	10	U																
Toluene	10	10	U	10	U																
Chlorobenzene	10	10	U	10	U																
Ethylbenzene	10	10	U	10	U																
Styrene	10	10	U	10	U																
Xylene (total)	10	10	U	10	U																

TB = Trip Blank

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BLANK AND SAMPLE DATA SUMMARY

SDG:B088P6	REVIEWER: DKW			DATE: 7/19/93				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
VBLK	Methylene Chloride	7	J		ug/L	35	70	B088P6	U

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DATA QUALIFICATION SUMMARY

SDG: B088P6	REVIEWER: DKW	DATE: 7/19/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Methylene Chloride	U	B088P6	Lab blank contamination

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD
Laboratory: TMA
Case | SDG: B088Q0

Sample Number		B088Q0		B088Q2		B088W0		B088W2		B088X0		B088X2		B08900		B08902					
Location		199-F1-2		199-F1-2		199-F5-46		199-F5-46		199-F5-48		199-F5-48		199-F8-3		199-F8-3					
Remarks		NV		TB, NV		NV		TB, NV		NV		TB, NV		NV		TB, NV					
Sample Date		4/02/93		4/02/93		4/03/93		4/03/93		4/03/93		4/03/93		4/03/93		4/03/93					
Analysis Date		4/09/93		4/09/93		4/09/93		4/09/93		4/09/93		4/09/93		4/09/93		4/09/93					
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromomethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Vinyl Chloride	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Chloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Methylene Chloride	10	10	U	4	J	10	U	4	J	10	U	64		2	J	10	U				
Acetone	10	10	U	24		10	U	21		10	U	49		9	J	8	J				
Carbon Disulfide	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Chloroform	10	2	J	10	U	4	J	10	U	1	J	10	U	10	U	10	U				
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Butanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromodichloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Trichloroethene	10	10	U	10	U	7	J	10	U	2	J	10	U	10	U	10	U				
Dibromochloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Benzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromoform	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
4-Methyl-2-pentanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Hexanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Tetrachloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Toluene	10	10	U	10	U	10	U	10	U	10	U	2	J	10	U	10	U				
Chlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Ethylbenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Styrene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Xylene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				

NV = Not Validated, TB = Trip Blank

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Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q5																				
Sample Number		B088Q5		B088Q7		B088V5		B088V7		B088Y0		B088Y2		B08910		B08912					
Location		199-F5-1		199-F5-1		199-F5-45		199-F5-45		199-F7-1		199-F7-1		199-F5-45		199-F5-45					
Remarks				TB				TB				TB		DUP		DUP, TB					
Sample Date		3/31/93		3/31/93		3/31/93		3/31/93		3/31/93		3/31/93		3/31/93		3/31/93					
Analysis Date		4/09/93		4/09/93		4/09/93		4/09/93		4/09/93		4/09/93		4/09/93		4/09/93					
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromomethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Vinyl Chloride	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Chloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Methylene Chloride	10	10	U	3	J	10	U	3	J	10	U	3	J	10	U	3	J				
Acetone	10	10	U	25		10	U	26		10	U	28		10	U	20					
Carbon Disulfide	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Chloroform	10	10	U	10	U	10		10	U	10	U	10	U	9	J	10	U				
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Butanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromodichloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Trichloroethene	10	10	U	10	U	3	J	10	U	28		10	U	3	J	10	U				
Dibromochloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Benzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromoform	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
4-Methyl-2-pentanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Hexanone	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Tetrachloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Toluene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Chlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Ethylbenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Styrene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Xylene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				

TB = Trip Blank, DUP = Duplicate

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BLANK AND SAMPLE DATA SUMMARY

SDG: B088Q5	REVIEWER: PBD			DATE: 8/2/93				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
B088Q7(TB)	Acetone	25			ug/L	125	250	B088Q5	U

DATA QUALIFICATION SUMMARY

SDG: B088Q5	REVIEWER: PBD	DATE: 8/2/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Acetone	U	B088Q5	Trip blank contamination

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R0																				
Sample Number		B088R0		B088R2		B088S5		B088S7		B088W5		B088W7		B08915		B08917					
Location		199-F5-3		199-F5-3		199-F5-6		199-F5-6		199-F5-47		199-F5-47		199-F5-47		199-F5-47					
Remarks		NV		TB, NV		NV		TB, NV		NV		TB, NV		DUP, NV		DUP, TB, NV					
Sample Date		4/07/93		4/07/93		4/07/93		4/07/93		4/07/93		4/07/93		4/07/93		4/07/93					
Analysis Date		4/13/93		4/13/93		4/13/93		4/13/93		4/13/93		4/13/93		4/13/93		4/13/93					
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromomethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Vinyl Chloride	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Chloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Methylene Chloride	10	10	U	2	J	10	U	2	J	10	U	10	U	10	U	2	J				
Acetone	10	10	U	7	J	10		10	U	8	J	10	U	10	U	10	U				
Carbon Disulfide	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Chloroform	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
2-Butanone	10	10	U	4	J	6	J	10	U	10	U	10	U	10	U	10	U				
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromodichloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Trichloroethene	10	10	U	10	U	10	U	10	U	2	J	10	U	10	U	10	U				
Dibromochloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Benzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Bromoform	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
4-Methyl-2-pentanone	10	10	U	10	U	2	J	10	U	10	U	10	U	10	U	10	U				
2-Hexanone	10	10	U	10	U	3	J	10	U	10	U	10	U	10	U	10	U				
Tetrachloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Toluene	10	2	J	2	J	10	U	10	U	1	J	10	U	10	U	10	U				
Chlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Ethylbenzene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Styrene	10	10	U	10	U	10	U	10	U	10	U	10	U	10	U	10	U				
Xylene (total)	10	1	J	10	U	10	U	10	U	10	U	10	U	10	U	10	U				

NV = Not Validated, TB = Trip Blank, DUP = Duplicate

9613400.1464 WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R5																				
Sample Number		B088R5		B088R7		B088T0		B088T2													
Location		199-F5-4		199-F5-4		199-F5-42		199-F5-42													
Remarks		NV		TB, NV		NV		TB, NV													
Sample Date		4/05/93		4/05/93		4/05/93		4/05/93													
Analysis Date		4/12/93		4/12/93		4/12/93		4/12/93													
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U												
Bromomethane	10	10	U	10	U	10	U	10	U												
Vinyl Chloride	10	10	U	10	U	10	U	10	U												
Chloroethane	10	10	U	10	U	10	U	10	U												
Methylene Chloride	10	10	U	3	J	10	U	10	U												
Acetone	10	10	U	29		10	U	15													
Carbon Disulfide	10	10	U	10	U	10	U	10	U												
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U												
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U												
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U												
Chloroform	10	10	U	10	U	10	U	10	U												
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U												
2-Butanone	10	10	U	10	U	10	U	10	U												
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U												
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U												
Bromodichloromethane	10	10	U	10	U	10	U	10	U												
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U												
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U												
Trichloroethene	10	1	J	10	U	10	U	10	U												
Dibromochloromethane	10	10	U	10	U	10	U	10	U												
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U												
Benzene	10	10	U	10	U	10	U	10	U												
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U												
Bromoform	10	10	U	10	U	10	U	10	U												
4-Methyl-2-pentanone	10	10	U	10	U	10	U	10	U												
2-Hexanone	10	10	U	10	U	10	U	10	U												
Tetrachloroethene	10	10	U	10	U	10	U	10	U												
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U												
Toluene	10	10	U	10	U	10	U	10	U												
Chlorobenzene	10	10	U	10	U	10	U	10	U												
Ethylbenzene	10	10	U	10	U	10	U	10	U												
Styrene	10	10	U	10	U	10	U	10	U												
Xylene (total)	10	10	U	10	U	10	U	10	U												

TB = Trip Blank, NV = Not Validated

9613401.4472
WHC-SD-EN-TI-187, Rev. 0

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088T5																				
Sample Number		B088T5		B088T7		B088X5		B088X7													
Location		199-F5-43A		199-F5-43A		199-F6-1		199-F6-1													
Remarks		NV		TB, NV		NV		TB, NV													
Sample Date		4/06/93		4/06/93		4/06/93		4/06/93													
Analysis Date		4/13/93		4/13/93		4/12/93		4/17/93													
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U												
Bromomethane	10	10	U	10	U	10	U	10	U												
Vinyl Chloride	10	10	U	10	U	10	U	10	U												
Chloroethane	10	10	U	10	U	10	U	10	U												
Methylene Chloride	10	10	U	10	U	10	U	10	U												
Acetone	10	10	U	10	U	10	U	10	U												
Carbon Disulfide	10	10	U	10	U	10	U	10	U												
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U												
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U												
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U												
Chloroform	10	10	U	10	U	10	U	10	U												
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U												
2-Butanone	10	10	U	10	U	10	U	10	U												
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U												
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U												
Bromodichloromethane	10	10	U	10	U	10	U	10	U												
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U												
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U												
Trichloroethene	10	10	U	10	U	10	U	10	U												
Dibromochloromethane	10	10	U	10	U	10	U	10	U												
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U												
Benzene	10	10	U	10	U	10	U	10	U												
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U												
Bromoform	10	10	U	10	U	10	U	10	U												
4-Methyl-2-pentanone	10	10	U	10	U	10	U	10	U												
2-Hexanone	10	10	U	10	U	10	U	10	U												
Tetrachloroethene	10	10	U	10	U	10	U	10	U												
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U												
Toluene	10	10	U	10	U	10	U	10	U												
Chlorobenzene	10	10	U	10	U	10	U	10	U												
Ethylbenzene	10	10	U	10	U	10	U	10	U												
Styrene	10	10	U	10	U	10	U	10	U												
Xylene (total)	10	10	U	10	U	10	U	10	U												

TB = Trip Blank, NV = Not Validated

96134010.1404 HNF-SD-EN-TI-187, Rev. 0

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088V0																				
Sample Number		B088V0		B088V2																	
Location		199-F5-44		199-F5-44																	
Remarks		NV		TB																	
Sample Date		4/01/93		4/01/93																	
Analysis Date		4/13/93		4/13/93																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U																
Bromomethane	10	10	U	10	U																
Vinyl Chloride	10	10	U	10	U																
Chloroethane	10	10	U	10	U																
Methylene Chloride	10	10	U	5	J																
Acetone	10	10	U	30																	
Carbon Disulfide	10	10	U	10	U																
1,1-Dichloroethene	10	10	U	10	U																
1,1-Dichloroethane	10	10	U	10	U																
1,2-Dichloroethene (total)	10	10	U	10	U																
Chloroform	10	10	U	10	U																
1,2-Dichloroethane	10	10	U	10	U																
2-Butanone	10	10	U	10	U																
1,1,1-Trichloroethane	10	10	U	10	U																
Carbon Tetrachloride	10	10	U	10	U																
Bromodichloromethane	10	10	U	10	U																
1,2-Dichloropropane	10	10	U	10	U																
cis-1,3-Dichloropropene	10	10	U	10	U																
Trichloroethene	10	10	U	10	U																
Dibromochloromethane	10	10	U	10	U																
1,1,2-Trichloroethane	10	10	U	10	U																
Benzene	10	10	U	10	U																
trans-1,3-Dichloropropene	10	10	U	10	U																
Bromoform	10	10	U	10	U																
4-Methyl-2-pentanone	10	10	U	10	U																
2-Hexanone	10	10	U	10	U																
Tetrachloroethene	10	10	U	10	U																
1,1,2,2-Tetrachloroethane	10	10	U	10	U																
Toluene	10	10	U	10	U																
Chlorobenzene	10	10	U	10	U																
Ethylbenzene	10	10	U	10	U																
Styrene	10	10	U	10	U																
Xylene (total)	10	10	U	10	U																

TB = Trip Blank, NV = Not Validated

9613401.4434 WHC-SD-EN-TI-187, Rev. 0

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Y5																				
Sample Number		B088Y5		B088Y7		B08905		B08907		B08934		B08935									
Location		199-F7-2		199-F7-2		199-F8-4		199-F8-4		MB 1		MB 2									
Remarks		NV		TB, NV		NV		TB, NV		MB, NV		TB, MB, NV									
Sample Date		4/08/93		4/08/93		4/08/93		4/08/93		4/08/93		4/08/93									
Analysis Date		4/20/93		4/19/93		4/20/93		4/19/93		4/19/93		4/19/93									
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Bromomethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Vinyl Chloride	10	10	U	10	U	10	U	10	U	10	U	10	U								
Chloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Methylene Chloride	10	10	U	10	U	10	U	10	U	10	U	10	U								
Acetone	10	10	U	10	U	10	U	10	U	53		18									
Carbon Disulfide	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U	10	U	10	U								
Chloroform	10	1	J	10	U	10	U	10	U	10	U	10	U								
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
2-Butanone	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U	10	U	10	U								
Bromodichloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U	10	U	10	U								
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U								
Trichloroethene	10	3	J	10	U	2	J	10	U	10	U	10	U								
Dibromochloromethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Benzene	10	10	U	10	U	10	U	10	U	10	U	10	U								
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U	10	U	10	U								
Bromoform	10	10	U	10	U	10	U	10	U	10	U	10	U								
4-Methyl-2-pentanone	10	10	U	10	U	10	U	10	U	10	U	10	U								
2-Hexanone	10	10	U	10	U	10	U	10	U	10	U	10	U								
Tetrachloroethene	10	10	U	10	U	10	U	10	U	10	U	10	U								
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U	10	U	10	U								
Toluene	10	2	J	10	U	10	U	10	U	3	J	3	J								
Chlorobenzene	10	10	U	10	U	10	U	10	U	10	U	10	U								
Ethylbenzene	10	10	U	10	U	10	U	10	U	10	U	10	U								
Styrene	10	10	U	10	U	10	U	10	U	10	U	10	U								
Xylene (total)	10	2	J	10	U	10	U	10	U	10	U	10	U								

MB = Method Blank, TB = Trip Blank, NV = Not Validated

9613401.1426 WHC-SD-EN-TI-187, Rev. 0

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z0																				
Sample Number		B088Z0		B088Z2																	
Location		199-F7-3		199-F7-3																	
Remarks		NV		TB, NV																	
Sample Date		4/09/93		4/09/93																	
Analysis Date		4/19/93		4/17/93																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U																
Bromomethane	10	10	U	10	U																
Vinyl Chloride	10	10	U	10	U																
Chloroethane	10	10	U	10	U																
Methylene Chloride	10	10	U	10	U																
Acetone	10	27		11																	
Carbon Disulfide	10	10	U	10	U																
1,1-Dichloroethene	10	10	U	10	U																
1,1-Dichloroethane	10	10	U	10	U																
1,2-Dichloroethene (total)	10	10	U	10	U																
Chloroform	10	10	U	10	U																
1,2-Dichloroethane	10	10	U	10	U																
2-Butanone	10	10	U	10	U																
1,1,1-Trichloroethane	10	10	U	10	U																
Carbon Tetrachloride	10	10	U	10	U																
Bromodichloromethane	10	10	U	10	U																
1,2-Dichloropropane	10	10	U	10	U																
cis-1,3-Dichloropropene	10	10	U	10	U																
Trichloroethene	10	3	J	10	U																
Dibromochloromethane	10	10	U	10	U																
1,1,2-Trichloroethane	10	10	U	10	U																
Benzene	10	10	U	10	U																
trans-1,3-Dichloropropene	10	10	U	10	U																
Bromoform	10	10	U	10	U																
4-Methyl-2-pentanone	10	10	U	10	U																
2-Hexanone	10	10	U	10	U																
Tetrachloroethene	10	10	U	10	U																
1,1,2,2-Tetrachloroethane	10	10	U	10	U																
Toluene	10	10	U	2	J																
Chlorobenzene	10	10	U	10	U																
Ethylbenzene	10	10	U	10	U																
Styrene	10	10	U	10	U																
Xylene (total)	10	10	U	10	U																

NV = Not Validated, TB = Trip Blank

9613410.1778
WHC-SD-EN-TI-187, Rev. 0

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z5																				
Sample Number		B088Z5		B088Z7		B08920		B08922													
Location		199-F8-2		199-F8-2		EB 1		EB 1													
Remarks				TB		EB		EB, TB													
Sample Date		4/12/93		4/12/93		4/12/93		4/12/93													
Analysis Date		4/19/93		4/19/93		4/19/93		4/19/93													
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U	10	U	10	U												
Bromomethane	10	10	U	10	U	10	U	10	U												
Vinyl Chloride	10	10	U	10	U	10	U	10	U												
Chloroethane	10	10	U	10	U	10	U	10	U												
Methylene Chloride	10	10	U	10	U	10	U	10	U												
Acetone	10	10	U	10	U	10	U	10	U												
Carbon Disulfide	10	10	U	10	U	10	U	10	U												
1,1-Dichloroethene	10	10	U	10	U	10	U	10	U												
1,1-Dichloroethane	10	10	U	10	U	10	U	10	U												
1,2-Dichloroethene (total)	10	10	U	10	U	10	U	10	U												
Chloroform	10	10	U	10	U	10	U	10	U												
1,2-Dichloroethane	10	10	U	10	U	10	U	10	U												
2-Butanone	10	10	U	10	U	10	U	10	U												
1,1,1-Trichloroethane	10	10	U	10	U	10	U	10	U												
Carbon Tetrachloride	10	10	U	10	U	10	U	10	U												
Bromodichloromethane	10	10	U	10	U	10	U	10	U												
1,2-Dichloropropane	10	10	U	10	U	10	U	10	U												
cis-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U												
Trichloroethene	10	10	U	10	U	10	U	10	U												
Dibromochloromethane	10	10	U	10	U	10	U	10	U												
1,1,2-Trichloroethane	10	10	U	10	U	10	U	10	U												
Benzene	10	10	U	10	U	10	U	10	U												
trans-1,3-Dichloropropene	10	10	U	10	U	10	U	10	U												
Bromoform	10	10	U	10	U	10	U	10	U												
4-Methyl-2-pentanone	10	10	U	10	U	10	U	10	U												
2-Hexanone	10	10	U	10	U	10	U	10	U												
Tetrachloroethene	10	10	U	10	U	10	U	10	U												
1,1,2,2-Tetrachloroethane	10	10	U	10	U	10	U	10	U												
Toluene	10	10	U	10	U	10	U	10	U												
Chlorobenzene	10	10	U	10	U	10	U	10	U												
Ethylbenzene	10	10	U	10	U	10	U	10	U												
Styrene	10	10	U	10	U	10	U	10	U												
Xylene (total)	10	10	U	10	U	10	U	10	U												

TB = Trip Blank, EB = Equipment Blank

9613401.1147 SD-EN-TI-187, Rev. 0

VOLATILE ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B08925																				
Sample Number		B08925		B08927																	
Location		EB 2		EB 2																	
Remarks		NV, EB		TB, NV, EB																	
Sample Date		4/13/93		4/13/93																	
Analysis Date		4/21/93		4/21/93																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U																
Bromomethane	10	10	U	10	U																
Vinyl Chloride	10	10	U	10	U																
Chloroethane	10	10	U	10	U																
Methylene Chloride	10	10	U	10	U																
Acetone	10	10	U	10	U																
Carbon Disulfide	10	10	U	10	U																
1,1-Dichloroethene	10	10	U	10	U																
1,1-Dichloroethane	10	10	U	10	U																
1,2-Dichloroethene (total)	10	10	U	10	U																
Chloroform	10	10	U	10	U																
1,2-Dichloroethane	10	10	U	10	U																
2-Butanone	10	10	U	10	U																
1,1,1-Trichloroethane	10	10	U	10	U																
Carbon Tetrachloride	10	10	U	10	U																
Bromodichloromethane	10	10	U	10	U																
1,2-Dichloropropane	10	10	U	10	U																
cis-1,3-Dichloropropene	10	10	U	10	U																
Trichloroethene	10	10	U	10	U																
Dibromochloromethane	10	10	U	10	U																
1,1,2-Trichloroethane	10	10	U	10	U																
Benzene	10	10	U	10	U																
trans-1,3-Dichloropropene	10	10	U	10	U																
Bromoform	10	10	U	10	U																
4-Methyl-2-pentanone	10	10	U	10	U																
2-Hexanone	10	10	U	10	U																
Tetrachloroethene	10	10	U	10	U																
1,1,2,2-Tetrachloroethane	10	10	U	10	U																
Toluene	10	10	U	1	J																
Chlorobenzene	10	10	U	10	U																
Ethylbenzene	10	10	U	10	U																
Styrene	10	10	U	10	U																
Xylene (total)	10	10	U	10	U																

EB = Equipment Blank, TB = Trip Blank, NV = Not Validated

96134[illegible] WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B08930																				
Sample Number		B08930		B08932																	
Location		199-F5-47		199-F5-47																	
Remarks		Split, NV		Split, TB, NV																	
Sample Date		04/07/93		04/07/93																	
Analysis Date		04/14/93		04/14/93																	
Volatile Organic Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	U	10	U																
Bromomethane	10	10	U	10	U																
Vinyl Chloride	10	10	U	10	U																
Chloroethane	10	10	U	10	U																
Methylene Chloride	10	10	U	2	J																
Acetone	10	10	U	10	U																
Carbon Disulfide	10	10	U	10	U																
1,1-Dichloroethene	10	10	U	10	U																
1,1-Dichloroethane	10	10	U	10	U																
1,2-Dichloroethene (total)	10	10	U	10	U																
Chloroform	10	10	U	10	U																
1,2-Dichloroethane	10	10	U	10	U																
2-Butanone	10	10	U	10	U																
1,1,1-Trichloroethane	10	10	U	10	U																
Carbon Tetrachloride	10	10	U	10	U																
Bromodichloromethane	10	10	U	10	U																
1,2-Dichloropropane	10	10	U	10	U																
cis-1,3-Dichloropropene	10	10	U	10	U																
Trichloroethene	10	10	U	10	U																
Dibromochloromethane	10	10	U	10	U																
1,1,2-Trichloroethane	10	10	U	10	U																
Benzene	10	10	U	10	U																
trans-1,3-Dichloropropene	10	10	U	10	U																
Bromoform	10	10	U	10	U																
4-Methyl-2-pentanone	10	10	U	10	U																
2-Hexanone	10	10	U	10	U																
Tetrachloroethene	10	10	U	10	U																
1,1,2,2-Tetrachloroethane	10	10	U	10	U																
Toluene	10	10	U	10	U																
Chlorobenzene	10	10	U	10	U																
Ethylbenzene	10	10	U	10	U																
Styrene	10	10	U	10	U																
Xylene (total)	10	10	U	10	U																

NV = Not Validated, TB = Trip Blank

9613401.4479 WHC-SD-EN-TI-187, Rev. 0

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	SEMIVOLATILES
199-F5-45	B088P6	W	03/31/93	V	3-7, 3-8
199-F1-2	B088Q0	W	04/02/93	NV	3-11, 3-12
199-F5-1	B088Q5	W	03/31/93	V	3-13, 3-14
199-F5-3	B088R0	W	04/07/93	NV	3-17, 3-18
199-F5-4	B088R5	W	04/05/93	NV	3-19, 3-20
199-F5-6	B088S5	W	04/07/93	NV	3-17, 3-18
199-F5-42	B088T0	W	04/05/93	NV	3-19, 3-20
199-F5-43A	B088T5	W	04/06/93	NV	3-21, 3-22
199-F5-44	B088V0	W	04/01/93	NV	3-23, 3-24
199-F5-45	B088V5	W	03/31/93	V	3-13, 3-14
199-F5-46	B088W0	W	04/03/93	NV	3-11, 3-12
199-F5-47	B088W5	W	04/07/93	NV	3-17, 3-18
199-F5-48	B088X0	W	04/03/93	NV	3-11, 3-12
199-F6-1	B088X5	W	04/06/93	NV	3-21, 3-22
199-F7-1	B088Y0	W	03/31/93	V	3-13, 3-14
199-F7-2	B088Y5	W	04/08/93	NV	3-25, 3-26
199-F7-3	B088Z0	W	04/09/93	NV	3-27, 3-28
199-F8-2	B088Z5	W	04/12/93	V	3-29, 3-30
199-F8-3	B08900	W	04/03/93	NV	3-11, 3-12
199-F8-4	B08905	W	04/08/93	NV	3-25, 3-26
199-F5-45	B08910	W	03/31/93	V	3-13, 3-14
199-F5-47	B08915	W	04/07/93	NV	3-17, 3-18
EB 1	B08920	W	04/12/93	V	3-29, 3-30
EB 2	B08925	W	04/13/93	NV	3-31, 3-32
199-F5-47	B08930	W	04/07/93	NV	3-33, 3-34

3.0 SEMIVOLATILE ORGANIC DATA VALIDATION

3.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6 B088Q5 B088Z5

Sample number B08910 in SDG No. B088Q5 was re-extracted and analyzed due to 0% recovery for all acid surrogates in the original sample. The reanalysis results (B08910RE) are included in this report.

3.2 HOLDING TIMES

Analytical holding times were assessed to ascertain whether the holding time requirements for semivolatile analyses were met by the laboratory. Westinghouse-Hanford protocols require that samples be extracted within seven days of collection and be analyzed within 40 days of extraction (WHC 1991a).

Based upon Westinghouse-Hanford data validation procedures, the seven-day extraction holding time was exceeded for sample number B08910RE in SDG No. B088Q5. The results were flagged "J" and are considered to be estimates.

Holding time requirements were met for all other samples.

3.3 INSTRUMENT CALIBRATION AND TUNING

3.3.1 GC/MS Tuning/Instrument Performance Check

Tuning is performed to ensure that mass resolution, and to some degree, sensitivity, of the GC/MS instrument has been established. When analyzing for semi volatile organic compounds, the GC/MS is tuned using DFTPP. The GC/MS must be tuned prior to the analysis of either standards or samples, and tuning must meet the criteria established by the analytical protocol. The specific criteria for acceptable GC/MS tuning using DFTPP are outlined in Westinghouse-Hanford procedures (WHC 1991) and in CLP protocols (EPA 1988a and 1988b).

As part of data validation, the original tuning data were checked for transcription and calculation errors to verify that tuning and performance criteria were met.

All tuning and performance criteria were met.

3.3.2 Initial Calibration

The GC/MS instrument is calibrated to ensure that it is capable of producing acceptable and reliable analytical data over a range of concentrations. The initial and continuing calibrations are to be performed according to CLP protocols. An initial multipoint calibration is performed prior to sample analysis to establish the linearity range of the GC/MS instrument. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

Instrument response is established by the initial calibration when the RRFs for all target compounds are greater than or equal to 0.05 units. Linearity is established when the RSDs of the RRFs are less than or equal to 30 percent.

All initial calibration results were acceptable.

3.3.3 Continuing Calibration

The criteria for accepting the continuing calibration require that a standard be analyzed at least once per 12 hour period and that the RRFs of all target compounds be greater than or equal to 0.05 units. In addition, the percent difference of these RRFs must be less than or equal to 25 percent of the average RRFs calculated for the associated initial calibration.

All continuing calibration results were acceptable.

3.4 BLANKS

Method blank and field blank analyses are performed to determine the extent of laboratory or field contamination of samples. No contaminants should be present in the blanks. Analytical results for analytes present in any sample at less than 5 times the concentration of that analyte found in associated blanks should be qualified as non-detects; in the case of certain common laboratory contaminants, results less than 10 times blank concentrations should be qualified as non-detects.

Due to the presence of laboratory blank contamination, the following sample was flagged "U" for di-n-butylphthalate:

- Sample number B088P6 in SDG No. B088P6.

Due to the presence of laboratory blank contamination, the following sample was flagged "U" for bis(2-ethylhexyl)phthalate:

- Sample number B088P6 in SDG No. B088P6.

All other laboratory blank results were acceptable.

3.5 ACCURACY

Accuracy was assessed by evaluating the recoveries of stable isotopically labeled surrogate compounds added to all samples and blanks, and by the analysis of a representative sample which was spiked with a variety of organic compounds.

3.5.1 Matrix Spike Recovery

Matrix spike compounds are added to a sample which is representative of the sample delivery group. Matrix spike analyses are performed in duplicate using the 11 compounds specified by CLP protocols. All recoveries for the 11 compounds should be within the established QC limits (EPA 1988b). The matrix spike analyses estimate how much the analyses for the target compounds are interfered with, either positively or negatively, by the sample matrix. Because the matrix spike is performed using only one of the samples extracted within the SDG, these data alone cannot be used to evaluate the precision and accuracy of individual samples.

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

3.5.2 Surrogate Recovery

Surrogate compound recoveries are calculated using analytical results from six stable, isotopically labeled surrogate compounds added to the sample prior to sample preparation and analysis. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. When recoveries for any two surrogate compounds are out of the control window, all positively identified target compound concentrations in samples associated with the unacceptable surrogate recoveries are qualified as estimates (J) and undetected compounds are qualified estimated below the detection limit (UJ).

Surrogate recovery results were acceptable for all samples.

3.6 PRECISION

The precision is expressed by the RPD between the recoveries of the matrix spike and the matrix spike duplicate analyses performed on a sample, and through a comparison of the results for field duplicate samples. Acceptable RPD control windows for matrix spike/matrix spike duplicate analyses have been established by the EPA CLP program.

Field precision is measured by analyzing duplicate samples taken in the field. No standards have been established for

qualifying data based on RPD for duplicate field samples by CLP protocols. Westinghouse-Hanford procedures establish the following criteria for duplicate field sample analyses for organic compounds, based on criteria established for inorganic analyses for laboratory duplicates:

1. For compounds whose concentrations are greater than 5 times CRQL, RPDs, must be ±20 percent for aqueous samples and ±35 percent for soil samples.

2. When one or more compounds are present at concentrations less than 5 times CRQL, the concentration difference must be ± CRQL for aqueous samples and ± CRQL for soil samples.

All matrix spike/matrix spike duplicate RPD results were acceptable for all samples.

3.7 SYSTEM PERFORMANCE

Internal standard performance was assessed to determine whether abrupt changes in instrument response and sensitivity occurred that may have affected the reliability of the analytical data. The response (area or height) of the internal standards must not vary by more than -50 percent or +100 percent from the response of the calibration standard that was used to calculate the upper and lower bounds. The upper and lower bounds define the range for acceptable internal standard response (area/height) for the sample analyses. In addition, retention times for the internal standard must not vary more than ±30 seconds from that of the associated calibration standard.

All internal standard results were acceptable.

3.8 COMPOUND IDENTIFICATION AND QUANTITATION

The identities of detected compounds were confirmed to investigate the possibility of false positives. The confirmation of compound identification during the QA review focuses on false positives because only mass spectra for positive identifications are submitted. However, target compounds that are reported as undetected are also evaluated to investigate the possibility of false negatives. Confirmation of possible false negatives is addressed by reviewing other factors relating to analytical sensitivity (e.g., detection limits, linearity, analytical recovery). Compound retention times and mass spectra must match those for the standard within set to tolerance limits (EPA 1988b).

3.8.1 Reported Results and Quantitation Limits

Compound quantitations and reported detection limits were recalculated and verified to ensure that they are accurate and are

consistent with the internal standards and relative retention times specified by the CLP scope of work.

At concentrations below the CRQL, instrument precision becomes more variable as the IDL is approached. Therefore, the concentrations of any compound detected below the CRQL are qualified as estimates.

All compound identifications and quantitations have been verified as correct.

3.8.2 Tentatively Identified Compounds

Several TICs were identified in the blanks and samples which were flagged "U" according to Westinghouse-Hanford protocols; if the sample result was ±0.06 RRT from that of the blank and if the sample result was less than 5 times the highest blank concentration.

3.9 OVERALL ASSESSMENT AND SUMMARY

A thorough review of ongoing data acquisition and instrument performance criteria was made to assess overall GC/MS instrument performance. No changes in instrument performance were noted that would result in the degradation of data quality. No indications of unacceptable instrument performance (i.e., shifts in baseline stability, retention time shifts, extraneous peaks, sensitivity) were found during the quality assurance review.

In general, the semivolatile data presented in this report met the protocol-specified QA/QC requirements. Minor laboratory blank contamination was detected in one sample. The sample to extraction holding time was exceeded, though not grossly exceeded, for one sample also. As required by Westinghouse-Hanford protocols, all results for this sample were flagged "J" and are considered to be estimates. All other data are considered valid and usable within the standard error associated with the method.

extraction holding time was exceeded, though not grossly exceeded, for one sample also. As required by Westinghouse-Hanford protocols, all results for this sample were flagged "J" and are considered to be estimates. All other data are considered valid and usable within the standard error associated with the method.

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B088P6																				
Sample Number		B088P6																			
Location		199-F5-45																			
Remarks		Split																			
Sample Date		3/31/93																			
Extraction Date		4/06/93																			
Analysis Date		4/26/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U																		
bis(2-Chloroethyl)ether	10	10	U																		
2-Chlorophenol	10	10	U																		
1,3-Dichlorobenzene	10	10	U																		
1,4-Dichlorobenzene	10	10	U																		
1,2-Dichlorobenzene	10	10	U																		
2-Methylphenol	10	10	U																		
2,2'-oxybis(1-Chloropropane)	10	10	U																		
4-Methylphenol	10	10	U																		
N-Nitroso-di-n-propylamine	10	10	U																		
Hexachloroethane	10	10	U																		
Nitrobenzene	10	10	U																		
Isophorone	10	10	U																		
2-Nitrophenol	10	10	U																		
2,4-Dimethylphenol	10	10	U																		
bis(2-Chloroethoxy)methane	10	10	U																		
2,4-Dichlorophenol	10	10	U																		
1,2,4-Trichlorobenzene	10	10	U																		
Naphthalene	10	10	U																		
4-Chloroaniline	10	10	U																		
Hexachlorobutadiene	10	10	U																		
4-Chloro-3-methylphenol	10	10	U																		
2-Methylnaphthalene	10	10	U																		
Hexachlorocyclopentadiene	10	10	U																		
2,4,6-Trichlorophenol	10	10	U																		
2,4,5-Trichlorophenol	50	25	U																		
2-Chloronaphthalene	10	10	U																		
2-Nitroaniline	50	25	U																		
Dimethylphthalate	10	10	U																		
Acenaphthylene	10	10	U																		
3-Nitroaniline	50	25	U																		
Acenaphthene	10	10	U																		
2,4-Dinitrophenol	50	25	U																		

9613401.1487

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Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B088P6																				
Sample Number		B088P6																			
Location		199-F5-45																			
Remarks		Split																			
Sample Date		3/31/93																			
Extraction Date		4/06/93																			
Analysis Date		4/26/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U																		
Dibenzofuran	10	10	U																		
2,4-Dinitrotoluene	10	10	U																		
2,6-Dinitrotoluene	10	10	U																		
Diethylphthalate	10	10	U																		
4-Chlorophenyl-phenylether	10	10	U																		
Fluorene	10	10	U																		
4-Nitroaniline	50	25	U																		
4,6-Dinitro-2-methylphenol	50	25	U																		
N-Nitrosodiphenylamine	10	10	U																		
4-Bromophenyl-phenylether	10	10	U																		
Hexachlorobenzene	10	10	U																		
Pentachlorophenol	50	25	U																		
Phenanthrene	10	10	U																		
Anthracene	10	10	U																		
Carbazole	10	10	U																		
Di-n-butylphthalate	10	10	U																		
Fluoranthene	10	10	U																		
Pyrene	10	10	U																		
Butylbenzylphthalate	10	10	U																		
3,3'-Dichlorobenzidine	10	10	U																		
Benzo(a)anthracene	10	10	U																		
bis(2-Ethylhexyl)phthalate	10	10	U																		
Chrysene	10	10	U																		
Di-n-octylphthalate	10	10	U																		
Benzo(b)fluoranthene	10	10	U																		
Benzo(k)fluoranthene	10	10	U																		
Benzo(a)pyrene	10	10	U																		
Indeno(1,2,3-cd)pyrene	10	10	U																		
Dibenzo(a,h)anthracene	10	10	U																		
Benzo(g,h,i)perylene	10	10	U																		

9613401.1488

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BLANK AND SAMPLE DATA SUMMARY

SDG:B088P6	REVIEWER: DKW			DATE: 7/20/93				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
SBLK	Di-n-butylphthalate	1	J		ug/L	5	10	B088P6	U
SBLK	bis(2-Ethylhexyl)phthalte	0.8	J		ug/L	4	8	B088P6	U

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DATA QUALIFICATION SUMMARY

SDG: B088P6	REVIEWER: DKW	DATE: 7/20/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Di-n-butylphthalate	U	B088P6	Lab blank contamination
bis(2-Ethylhexyl)-phthalate	U	B088P6	Lab blank contamination

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q0																				
Sample Number		B088Q0		B088W0		B088X0		B08900													
Location		199-F1-2		199-F5-46		199-F5-48		199-F8-3													
Remarks		NV		NV		NV		NV													
Sample Date		4/02/93		4/03/93		4/03/93		4/03/93													
Extraction Date		4/08/93		4/08/93		4/08/93		4/08/93													
Analysis Date		4/14/93		4/14/93		4/14/93		4/14/93													
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U	10	U	10	U	10	U												
bis(2-Chloroethyl)ether	10	10	U	10	U	10	U	10	U												
2-Chlorophenol	10	10	U	10	U	10	U	10	U												
1,3-Dichlorobenzene	10	10	U	10	U	10	U	10	U												
1,4-Dichlorobenzene	10	10	U	10	U	10	U	10	U												
1,2-Dichlorobenzene	10	10	U	10	U	10	U	10	U												
2-Methylphenol	10	10	U	10	U	10	U	10	U												
2,2'-oxybis(1-Chloropropane)	10	10	U	10	U	10	U	10	U												
4-Methylphenol	10	10	U	10	U	10	U	10	U												
N-Nitroso-di-n-propylamine	10	10	U	10	U	10	U	10	U												
Hexachloroethane	10	10	U	10	U	10	U	10	U												
Nitrobenzene	10	10	U	10	U	10	U	10	U												
Isophorone	10	10	U	10	U	10	U	10	U												
2-Nitrophenol	10	10	U	10	U	10	U	10	U												
2,4-Dimethylphenol	10	10	U	10	U	10	U	10	U												
bis(2-Chloroethoxy)methane	10	10	U	10	U	10	U	10	U												
2,4-Dichlorophenol	10	10	U	10	U	10	U	10	U												
1,2,4-Trichlorobenzene	10	10	U	10	U	10	U	10	U												
Naphthalene	10	10	U	10	U	10	U	10	U												
4-Chloroaniline	10	10	U	10	U	10	U	10	U												
Hexachlorobutadiene	10	10	U	10	U	10	U	10	U												
4-Chloro-3-methylphenol	10	10	U	10	U	10	U	10	U												
2-Methylnaphthalene	10	10	U	10	U	10	U	10	U												
Hexachlorocyclopentadiene	10	10	U	10	U	10	U	10	U												
2,4,6-Trichlorophenol	10	10	U	10	U	10	U	10	U												
2,4,5-Trichlorophenol	50	25	U	25	U	25	U	25	U												
2-Chloronaphthalene	10	10	U	10	U	10	U	10	U												
2-Nitroaniline	50	25	U	25	U	25	U	25	U												
Dimethylphthalate	10	10	U	10	U	10	U	10	U												
Acenaphthylene	10	10	U	10	U	10	U	10	U												
3-Nitroaniline	50	25	U	25	U	25	U	25	U												
Acenaphthene	10	10	U	10	U	10	U	10	U												
2,4-Dinitrophenol	50	25	U	25	U	25	U	25	U												

NV = Not Validated

96134014.1491

WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q0																				
Sample Number		B088Q0		B088W0		B088X0		B08900													
Location		199-F1-2		199-F5-46		199-F5-48		199-F8-3													
Remarks		NV		NV		NV		NV													
Sample Date		4/02/93		4/03/93		4/03/93		4/03/93													
Extraction Date		4/08/93		4/08/93		4/08/93		4/08/93													
Analysis Date		4/14/93		4/14/93		4/14/93		4/14/93													
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U	25	U	25	U												
Dibenzofuran	10	10	U	10	U	10	U	10	U												
2,4-Dinitrotoluene	10	10	U	10	U	10	U	10	U												
2,6-Dinitrotoluene	10	10	U	10	U	10	U	10	U												
Diethylphthalate	10	10	U	10	U	10	U	16													
4-Chlorophenyl-phenylether	10	10	U	10	U	10	U	10	U												
Fluorene	10	10	U	10	U	10	U	10	U												
4-Nitroaniline	50	25	U	25	U	25	U	25	U												
4,6-Dinitro-2-methylphenol	50	25	U	25	U	25	U	25	U												
N-Nitrosodiphenylamine	10	10	U	10	U	10	U	10	U												
4-Bromophenyl-phenylether	10	10	U	10	U	10	U	10	U												
Hexachlorobenzene	10	10	U	10	U	10	U	10	U												
Pentachlorophenol	50	25	U	25	U	25	U	25	U												
Phenanthrene	10	10	U	10	U	10	U	10	U												
Anthracene	10	10	U	10	U	10	U	10	U												
Carbazole	10	10	U	10	U	10	U	10	U												
Di-n-butylphthalate	10	10	U	10	U	10	U	10	U												
Fluoranthene	10	10	U	10	U	10	U	10	U												
Pyrene	10	10	U	10	U	10	U	10	U												
Butylbenzylphthalate	10	10	U	10	U	10	U	10	U												
3,3'-Dichlorobenzidine	10	10	U	10	U	10	U	10	U												
Benzo(a)anthracene	10	10	U	10	U	10	U	10	U												
bis(2-Ethylhexyl)phthalate	10	10	U	10	U	4	J	10	U												
Chrysene	10	10	U	10	U	10	U	10	U												
Di-n-octylphthalate	10	10	U	10	U	10	U	10	U												
Benzo(b)fluoranthene	10	10	U	10	U	10	U	10	U												
Benzo(k)fluoranthene	10	10	U	10	U	10	U	10	U												
Benzo(a)pyrene	10	10	U	10	U	10	U	10	U												
Indeno(1,2,3-cd)pyrene	10	10	U	10	U	10	U	10	U												
Dibenz(a,h)anthracene	10	10	U	10	U	10	U	10	U												
Benzo(g,h,i)perylene	10	10	U	10	U	10	U	10	U												

NV = Not Validated

9613401.1112

WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q5																				
Sample Number		B088Q5		B088V5		B088Y0		B08910RE													
Location		199-F5-1		199-F5-45		199-F7-1		199-F5-45													
Remarks								DUP,RE													
Sample Date		3/31/93		3/31/93		3/31/93		3/31/93													
Extraction Date		4/05/93		4/05/93		4/05/93		4/14/93													
Analysis Date		4/13/93		4/13/93		4/13/93		4/23/93													
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U	10	U	10	U	10	UJ												
bis(2-Chloroethyl)ether	10	10	U	10	U	10	U	10	UJ												
2-Chlorophenol	10	10	U	10	U	10	U	10	UJ												
1,3-Dichlorobenzene	10	10	U	10	U	10	U	10	UJ												
1,4-Dichlorobenzene	10	10	U	10	U	10	U	10	UJ												
1,2-Dichlorobenzene	10	10	U	10	U	10	U	10	UJ												
2-Methylphenol	10	10	U	10	U	10	U	10	UJ												
2,2'-oxybis(1-Chloropropane)	10	10	U	10	U	10	U	10	UJ												
4-Methylphenol	10	10	U	10	U	10	U	10	UJ												
N-Nitroso-di-n-propylamine	10	10	U	10	U	10	U	10	UJ												
Hexachloroethane	10	10	U	10	U	10	U	10	UJ												
Nitrobenzene	10	10	U	10	U	10	U	10	UJ												
Isophorone	10	10	U	10	U	10	U	10	UJ												
2-Nitrophenol	10	10	U	10	U	10	U	10	UJ												
2,4-Dimethylphenol	10	10	U	10	U	10	U	10	UJ												
bis(2-Chloroethoxy)methane	10	10	U	10	U	10	U	10	UJ												
2,4-Dichlorophenol	10	10	U	10	U	10	U	10	UJ												
1,2,4-Trichlorobenzene	10	10	U	10	U	10	U	10	UJ												
Naphthalene	10	10	U	10	U	10	U	10	UJ												
4-Chloroaniline	10	10	U	10	U	10	U	10	UJ												
Hexachlorobutadiene	10	10	U	10	U	10	U	10	UJ												
4-Chloro-3-methylphenol	10	10	U	10	U	10	U	10	UJ												
2-Methylnaphthalene	10	10	U	10	U	10	U	10	UJ												
Hexachlorocyclopentadiene	10	10	U	10	U	10	U	10	UJ												
2,4,6-Trichlorophenol	10	10	U	10	U	10	U	10	UJ												
2,4,5-Trichlorophenol	50	25	U	25	U	25	U	25	UJ												
2-Chloronaphthalene	10	10	U	10	U	10	U	10	UJ												
2-Nitroaniline	50	25	U	25	U	25	U	25	UJ												
Dimethylphthalate	10	10	U	10	U	10	U	10	UJ												
Acenaphthylene	10	10	U	10	U	10	U	10	UJ												
3-Nitroaniline	50	25	U	25	U	25	U	25	UJ												
Acenaphthene	10	10	U	10	U	10	U	10	UJ												
2,4-Dinitrophenol	50	25	U	25	U	25	U	25	UJ												

DUP = Duplicate, RE = Re-extraction

9613401.1493 WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q5																				
Sample Number		B088Q5		B088V5		B088Y0		B08910RE													
Location		199-F5-1		199-F5-45		199-F7-1		199-F5-45													
Remarks								DUP,RE													
Sample Date		3/31/93		3/31/93		3/31/93		3/31/93													
Extraction Date		4/05/93		4/05/93		4/05/93		4/14/93													
Analysis Date		4/13/93		4/13/93		4/13/93		4/23/93													
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U	25	U	25	UJ												
Dibenzofuran	10	10	U	10	U	10	U	10	UJ												
2,4-Dinitrotoluene	10	10	U	10	U	10	U	10	UJ												
2,6-Dinitrotoluene	10	10	U	10	U	10	U	10	UJ												
Diethylphthalate	10	10	U	10	U	10	U	10	UJ												
4-Chlorophenyl-phenylether	10	10	U	10	U	10	U	10	UJ												
Fluorene	10	10	U	10	U	10	U	10	UJ												
4-Nitroaniline	50	25	U	25	U	25	U	25	UJ												
4,6-Dinitro-2-methylphenol	50	25	U	25	U	25	U	25	UJ												
N-Nitrosodiphenylamine	10	10	U	10	U	10	U	10	UJ												
4-Bromophenyl-phenylether	10	10	U	10	U	10	U	10	UJ												
Hexachlorobenzene	10	10	U	10	U	10	U	10	UJ												
Pentachlorophenol	50	25	U	25	U	25	U	25	UJ												
Phenanthrene	10	10	U	10	U	10	U	10	UJ												
Anthracene	10	10	U	10	U	10	U	10	UJ												
Carbazole	10	10	U	10	U	10	U	10	UJ												
Di-n-butylphthalate	10	10	U	10	U	10	U	10	UJ												
Fluoranthene	10	10	U	10	U	10	U	10	UJ												
Pyrene	10	10	U	10	U	10	U	10	UJ												
Butylbenzylphthalate	10	10	U	10	U	10	U	10	UJ												
3,3'-Dichlorobenzidine	10	10	U	10	U	10	U	10	UJ												
Benzo(a)anthracene	10	10	U	10	U	10	U	10	UJ												
bis(2-Ethylhexyl)phthalate	10	14		10	U	10	U	10	UJ												
Chrysene	10	10	U	10	U	10	U	10	UJ												
Di-n-octylphthalate	10	10	U	10	U	10	U	10	UJ												
Benzo(b)fluoranthene	10	10	U	10	U	10	U	10	UJ												
Benzo(k)fluoranthene	10	10	U	10	U	10	U	10	UJ												
Benzo(a)pyrene	10	10	U	10	U	10	U	10	UJ												
Indeno(1,2,3-cd)pyrene	10	10	U	10	U	10	U	10	UJ												
Dibenzo(a,h)anthracene	10	10	U	10	U	10	U	10	UJ												
Benzo(g,h,i)perylene	10	10	U	10	U	10	U	10	UJ												

DUP = Duplicate, RE = Re-extraction

96134013.1194 WHC-SD-EN-TI-187, Rev. 0

HOLDING TIME SUMMARY

SDG: B088Q5	REVIEWER: DT			DATE: 7/22/93		PAGE_1_OF_1_	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B08910RE	BNA	3/31/93	4/14/93	4/23/93	7	40	J

9613401.4496

DATA QUALIFICATION SUMMARY

SDG: B088Q5	REVIEWER: DT	DATE: 7/22/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All BNA analytes	J	B08910RE	Exceeded holding time

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R0																				
Sample Number		B088R0		B088S5		B088W5		B08915													
Location		199-F5-3		199-F5-6		199-F5-47		199-F5-47													
Remarks		NV		NV		NV		DUP, NV													
Sample Date		4/07/93		4/07/93		4/07/93		4/07/93													
Extraction Date		4/12/93		4/12/93		4/12/93		4/12/93													
Analysis Date		4/23/93		4/23/93		4/24/93		4/26/93													
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	1	J	10	U	10	U	10	U												
bis(2-Chloroethyl)ether	10	10	U	10	U	10	U	10	U												
2-Chlorophenol	10	10	U	10	U	10	U	10	U												
1,3-Dichlorobenzene	10	10	U	10	U	10	U	10	U												
1,4-Dichlorobenzene	10	10	U	10	U	10	U	10	U												
1,2-Dichlorobenzene	10	10	U	10	U	10	U	10	U												
2-Methylphenol	10	10	U	10	U	10	U	10	U												
2,2'-oxybis(1-Chloropropane)	10	10	U	10	U	10	U	10	U												
4-Methylphenol	10	10	U	10	U	10	U	10	U												
N-Nitroso-di-n-propylamine	10	10	U	10	U	10	U	10	U												
Hexachloroethane	10	10	U	10	U	10	U	10	U												
Nitrobenzene	10	10	U	10	U	10	U	10	U												
Isophorone	10	10	U	10	U	10	U	10	U												
2-Nitrophenol	10	10	U	10	U	10	U	10	U												
2,4-Dimethylphenol	10	10	U	10	U	10	U	10	U												
bis(2-Chloroethoxy)methane	10	10	U	10	U	10	U	10	U												
2,4-Dichlorophenol	10	10	U	10	U	10	U	10	U												
1,2,4-Trichlorobenzene	10	10	U	10	U	10	U	10	U												
Naphthalene	10	10	U	10	U	10	U	10	U												
4-Chloroaniline	10	10	U	10	U	10	U	10	U												
Hexachlorobutadiene	10	10	U	10	U	10	U	10	U												
4-Chloro-3-methylphenol	10	10	U	10	U	10	U	10	U												
2-Methylnaphthalene	10	10	U	10	U	10	U	10	U												
Hexachlorocyclopentadiene	10	10	U	10	U	10	U	10	U												
2,4,6-Trichlorophenol	10	10	U	10	U	10	U	10	U												
2,4,5-Trichlorophenol	50	25	U	25	U	25	U	25	U												
2-Chloronaphthalene	10	10	U	10	U	10	U	10	U												
2-Nitroaniline	50	25	U	25	U	25	U	25	U												
Dimethylphthalate	10	10	U	10	U	10	U	10	U												
Acenaphthylene	10	10	U	10	U	10	U	10	U												
3-Nitroaniline	50	25	U	25	U	25	U	25	U												
Acenaphthene	10	10	U	10	U	10	U	10	U												
2,4-Dinitrophenol	50	25	U	25	U	25	U	25	U												

NV = Not Validated, DUP = Duplicate

9613401.1457 HC-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R0																				
Sample Number		B088R0		B088S5		B088W5		B08915													
Location		199-F5-3		199-F5-6		199-F5-47		199-F5-47													
Remarks		NV		NV		NV		DUP, NV													
Sample Date		4/07/93		4/07/93		4/07/93		4/07/93													
Extraction Date		4/12/93		4/12/93		4/12/93		4/12/93													
Analysis Date		4/23/93		4/23/93		4/24/93		4/26/93													
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U	25	U	25	U												
Dibenzofuran	10	10	U	10	U	10	U	10	U												
2,4-Dinitrotoluene	10	10	U	10	U	10	U	10	U												
2,6-Dinitrotoluene	10	10	U	10	U	10	U	10	U												
Diethylphthalate	10	10	U	10	U	10	U	10	U												
4-Chlorophenyl-phenylether	10	10	U	10	U	10	U	10	U												
Fluorene	10	10	U	10	U	10	U	10	U												
4-Nitroaniline	50	25	U	25	U	25	U	25	U												
4,6-Dinitro-2-methylphenol	50	25	U	25	U	25	U	25	U												
N-Nitrosodiphenylamine	10	10	U	10	U	10	U	10	U												
4-Bromophenyl-phenylether	10	10	U	10	U	10	U	10	U												
Hexachlorobenzene	10	10	U	10	U	10	U	10	U												
Pentachlorophenol	50	25	U	25	U	25	U	25	U												
Phenanthrene	10	10	U	10	U	10	U	10	U												
Anthracene	10	10	U	10	U	10	U	10	U												
Carbazole	10	10	U	10	U	10	U	10	U												
Di-n-butylphthalate	10	10	U	10	U	10	U	10	U												
Fluoranthene	10	10	U	10	U	10	U	10	U												
Pyrene	10	10	U	10	U	10	U	10	U												
Butylbenzylphthalate	10	10	U	10	U	10	U	10	U												
3,3'-Dichlorobenzidine	10	10	U	10	U	10	U	10	U												
Benzo(a)anthracene	10	10	U	10	U	10	U	10	U												
bis(2-Ethylhexyl)phthalate	10	10	U	10	U	10	U	10	U												
Chrysene	10	10	U	10	U	10	U	10	U												
Di-n-octylphthalate	10	10	U	10	U	10	U	10	U												
Benzo(b)fluoranthene	10	10	U	10	U	10	U	10	U												
Benzo(k)fluoranthene	10	10	U	10	U	10	U	10	U												
Benzo(a)pyrene	10	10	U	10	U	10	U	10	U												
Indeno(1,2,3-cd)pyrene	10	10	U	10	U	10	U	10	U												
Dibenzo(a,h)anthracene	10	10	U	10	U	10	U	10	U												
Benzo(g,h,i)perylene	10	10	U	10	U	10	U	10	U												

NV = Not Validated, DUP = Duplicate

9613401.1190
WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R5																				
Sample Number		B088R5		B088T0																	
Location		199-F5-4		199-F5-42																	
Remarks		NV		NV																	
Sample Date		4/05/93		4/05/93																	
Extraction Date		4/08/93		4/08/93																	
Analysis Date		4/14/93		4/15/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U	10	U																
bis(2-Chloroethyl)ether	10	10	U	10	U																
2-Chlorophenol	10	10	U	10	U																
1,3-Dichlorobenzene	10	10	U	10	U																
1,4-Dichlorobenzene	10	10	U	10	U																
1,2-Dichlorobenzene	10	10	U	10	U																
2-Methylphenol	10	10	U	10	U																
2,2'-oxybis(1-Chloropropane)	10	10	U	10	U																
4-Methylphenol	10	10	U	10	U																
N-Nitroso-di-n-propylamine	10	10	U	10	U																
Hexachloroethane	10	10	U	10	U																
Nitrobenzene	10	10	U	10	U																
Isophorone	10	10	U	10	U																
2-Nitrophenol	10	10	U	10	U																
2,4-Dimethylphenol	10	10	U	10	U																
bis(2-Chloroethoxy)methane	10	10	U	10	U																
2,4-Dichlorophenol	10	10	U	10	U																
1,2,4-Trichlorobenzene	10	10	U	10	U																
Naphthalene	10	10	U	10	U																
4-Chloroaniline	10	10	U	10	U																
Hexachlorobutadiene	10	10	U	10	U																
4-Chloro-3-methylphenol	10	10	U	10	U																
2-Methylnaphthalene	10	10	U	10	U																
Hexachlorocyclopentadiene	10	10	U	10	U																
2,4,6-Trichlorophenol	10	10	U	10	U																
2,4,5-Trichlorophenol	50	25	U	25	U																
2-Chloronaphthalene	10	10	U	10	U																
2-Nitroaniline	50	25	U	25	U																
Dimethylphthalate	10	10	U	10	U																
Acenaphthylene	10	10	U	10	U																
3-Nitroaniline	50	25	U	25	U																
Acenaphthene	10	10	U	10	U																
2,4-Dinitrophenol	50	25	U	25	U																

NV = Not Validated

9613401.1499
WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																						
Laboratory: TMA																						
Case	SDG: B088R5																					
Sample Number		B088R5		B088T0																		
Location		199-F5-4		199-F5-42																		
Remarks		NV		NV																		
Sample Date		4/05/93		4/05/93																		
Extraction Date		4/08/93		4/08/93																		
Analysis Date		4/14/93		4/15/93																		
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U																
Dibenzofuran	10	10	U	10	U																
2,4-Dinitrotoluene	10	10	U	10	U																
2,6-Dinitrotoluene	10	10	U	10	U																
Diethylphthalate	10	10	U	10	U																
4-Chlorophenyl-phenylether	10	10	U	10	U																
Fluorene	10	10	U	10	U																
4-Nitroaniline	50	25	U	25	U																
4,6-Dinitro-2-methylphenol	50	25	U	25	U																
N-Nitrosodiphenylamine	10	10	U	10	U																
4-Bromophenyl-phenylether	10	10	U	10	U																
Hexachlorobenzene	10	10	U	10	U																
Pentachlorophenol	50	25	U	25	U																
Phenanthrene	10	10	U	10	U																
Anthracene	10	10	U	10	U																
Carbazole	10	10	U	10	U																
Di-n-butylphthalate	10	10	U	10	U																
Fluoranthene	10	10	U	10	U																
Pyrene	10	10	U	10	U																
Butylbenzylphthalate	10	10	U	10	U																
3,3'-Dichlorobenzidine	10	10	U	10	U																
Benzo(a)anthracene	10	10	U	10	U																
bis(2-Ethylhexyl)phthalate	10	10	U	10	U																
Chrysene	10	10	U	10	U																
Di-n-octylphthalate	10	10	U	10	U																
Benzo(b)fluoranthene	10	10	U	10	U																
Benzo(k)fluoranthene	10	10	U	10	U																
Benzo(a)pyrene	10	10	U	10	U																
Indeno(1,2,3-cd)pyrene	10	10	U	10	U																
Dibenz(a,h)anthracene	10	10	U	10	U																
Benzo(g,h,i)perylene	10	10	U	10	U																

NV = Not Validated

9613407.1500

WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088T5																				
Sample Number		B088T5		B088X5																	
Location		199-F5-43A		199-F6-1																	
Remarks		NV		NV																	
Sample Date		4/06/93		4/06/93																	
Extraction Date		4/09/93		4/09/93																	
Analysis Date		5/04/93		5/04/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U																
Dibenzofuran	10	10	U	10	U																
2,4-Dinitrotoluene	10	10	U	10	U																
2,6-Dinitrotoluene	10	10	U	10	U																
Diethylphthalate	10	10	U	10	U																
4-Chlorophenyl-phenylether	10	10	U	10	U																
Fluorene	10	10	U	10	U																
4-Nitroaniline	50	25	U	25	U																
4,6-Dinitro-2-methylphenol	50	25	U	25	U																
N-Nitrosodiphenylamine	10	10	U	10	U																
4-Bromophenyl-phenylether	10	10	U	10	U																
Hexachlorobenzene	10	10	U	10	U																
Pentachlorophenol	50	25	U	25	U																
Phenanthrene	10	10	U	10	U																
Anthracene	10	10	U	10	U																
Carbazole	10	10	U	10	U																
Di-n-butylphthalate	10	10	U	10	U																
Fluoranthene	10	10	U	10	U																
Pyrene	10	10	U	10	U																
Butylbenzylphthalate	10	10	U	10	U																
3,3'-Dichlorobenzidine	10	10	U	10	U																
Benzo(a)anthracene	10	10	U	10	U																
bis(2-Ethylhexyl)phthalate	10	10	U	10	U																
Chrysene	10	10	U	10	U																
Di-n-octylphthalate	10	10	U	10	U																
Benzo(b)fluoranthene	10	10	U	10	U																
Benzo(k)fluoranthene	10	10	U	10	U																
Benzo(a)pyrene	10	10	U	10	U																
Indeno(1,2,3-cd)pyrene	10	10	U	10	U																
Dibenzo(a,h)anthracene	10	10	U	10	U																
Benzo(g,h,i)perylene	10	10	U	10	U																

NV = Not Validated

96134018 WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088V0																				
Sample Number		B088V0																			
Location		199-F5-44																			
Remarks		NV																			
Sample Date		4/01/93																			
Extraction Date		4/06/93																			
Analysis Date		4/13/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U																		
bis(2-Chloroethyl)ether	10	10	U																		
2-Chlorophenol	10	10	U																		
1,3-Dichlorobenzene	10	10	U																		
1,4-Dichlorobenzene	10	10	U																		
1,2-Dichlorobenzene	10	10	U																		
2-Methylphenol	10	10	U																		
2,2'-oxybis(1-Chloropropane)	10	10	U																		
4-Methylphenol	10	10	U																		
N-Nitroso-Di-n-propylamine	10	10	U																		
Hexachloroethane	10	10	U																		
Nitrobenzene	10	10	U																		
Isophorone	10	10	U																		
2-Nitrophenol	10	10	U																		
2,4-Dimethylphenol	10	10	U																		
bis(2-Chloroethoxy)methane	10	10	U																		
2,4-Dichlorophenol	10	10	U																		
1,2,4-Trichlorobenzene	10	10	U																		
Naphthalene	10	10	U																		
4-Chloroaniline	10	10	U																		
Hexachlorobutadiene	10	10	U																		
4-Chloro-3-methylphenol	10	10	U																		
2-Methylnaphthalene	10	10	U																		
Hexachlorocyclopentadiene	10	10	U																		
2,4,6-Trichlorophenol	10	10	U																		
2,4,5-Trichlorophenol	50	25	U																		
2-Chloronaphthalene	10	10	U																		
2-Nitroaniline	50	25	U																		
Dimethylphthalate	10	10	U																		
Acenaphthylene	10	10	U																		
3-Nitroaniline	50	25	U																		
Acenaphthene	10	10	U																		
2,4-Dinitrophenol	50	25	U																		

NV = Not Validated

961340.1502 WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE HANFORD																					
Laboratory: TMA																					
Case	SDG: B088V0																				
Sample Number		B088V0																			
Location		199-F5-44																			
Remarks		NV																			
Sample Date		4/01/93																			
Extraction Date		4/06/93																			
Analysis Date		4/13/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U																		
Dibenzofuran	10	10	U																		
2,4-Dinitrotoluene	10	10	U																		
2,6-Dinitrotoluene	10	10	U																		
Diethylphthalate	10	10	U																		
4-Chlorophenyl-phenylether	10	10	U																		
Fluorene	10	10	U																		
4-Nitroaniline	50	25	U																		
4,6-Dinitro-2-methylphenol	50	25	U																		
N-Nitrosodiphenylamine	10	10	U																		
4-Bromophenyl-phenylether	10	10	U																		
Hexachlorobenzene	10	10	U																		
Pentachlorophenol	50	25	U																		
Phenanthrene	10	10	U																		
Anthracene	10	10	U																		
Carbazole	10	10	U																		
Di-n-butylphthalate	10	10	U																		
Fluoranthene	10	10	U																		
Pyrene	10	10	U																		
Butylbenzylphthalate	10	10	U																		
3,3'-Dichlorobenzidine	10	10	U																		
Benzo(a)anthracene	10	10	U																		
bis(2-Ethylhexyl)phthalate	10	10	U																		
Chrysene	10	10	U																		
Di-n-octylphthalate	10	10	U																		
Benzo(b)fluoranthene	10	10	U																		
Benzo(k)fluoranthene	10	10	U																		
Benzo(a)pyrene	10	10	U																		
Indeno(1,2,3-cd)pyrene	10	10	U																		
Dibenz(a,h)anthracene	10	10	U																		
Benzo(g,h,i)perylene	10	10	U																		

NV = Not Validated

9613401.1503

WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Y5																				
Sample Number		B088Y5		B08905																	
Location		199-F7-2		199-F8-4																	
Remarks		NV		NV																	
Sample Date		4/08/93		4/08/93																	
Extraction Date		4/13/93		4/13/93																	
Analysis Date		5/04/93		5/05/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U																
Dibenzofuran	10	10	U	10	U																
2,4-Dinitrotoluene	10	10	U	10	U																
2,6-Dinitrotoluene	10	10	U	10	U																
Diethylphthalate	10	10	U	10	U																
4-Chlorophenyl-phenylether	10	10	U	10	U																
Fluorene	10	10	U	10	U																
4-Nitroaniline	50	25	U	25	U																
4,6-Dinitro-2-methylphenol	50	25	U	25	U																
N-Nitrosodiphenylamine	10	10	U	10	U																
4-Bromophenyl-phenylether	10	10	U	10	U																
Hexachlorobenzene	10	10	U	10	U																
Pentachlorophenol	50	25	U	25	U																
Phenanthrene	10	10	U	10	U																
Anthracene	10	10	U	10	U																
Carbazole	10	10	U	10	U																
Di-n-butylphthalate	10	10	U	10	U																
Fluoranthene	10	10	U	10	U																
Pyrene	10	10	U	10	U																
Butylbenzylphthalate	10	10	U	10	U																
3,3'-Dichlorobenzidine	10	10	U	10	U																
Benzo(a)anthracene	10	10	U	10	U																
bis(2-Ethylhexyl)phthalate	10	10	U	58																	
Chrysene	10	10	U	10	U																
Di-n-octylphthalate	10	10	U	10	U																
Benzo(b)fluoranthene	10	10	U	10	U																
Benzo(k)fluoranthene	10	10	U	10	U																
Benzo(a)pyrene	10	10	U	10	U																
Indeno(1,2,3-cd)pyrene	10	10	U	10	U																
Dibenz(a,h)anthracene	10	10	U	10	U																
Benzo(g,h,i)perylene	10	10	U	10	U																

NV = Not Validated

9613401.1504 WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z0																				
Sample Number		B088Z0																			
Location		199-F7-3																			
Remarks		NV																			
Sample Date		4/09/93																			
Extraction Date		4/14/93																			
Analysis Date		5/06/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U																		
Dibenzofuran	10	10	U																		
2,4-Dinitrotoluene	10	10	U																		
2,6-Dinitrotoluene	10	10	U																		
Diethylphthalate	10	10	U																		
4-Chlorophenyl-phenylether	10	10	U																		
Fluorene	10	10	U																		
4-Nitroaniline	50	25	U																		
4,6-Dinitro-2-methylphenol	50	25	U																		
N-Nitrosodiphenylamine	10	10	U																		
4-Bromophenyl-phenylether	10	10	U																		
Hexachlorobenzene	10	10	U																		
Pentachlorophenol	50	25	U																		
Phenanthrene	10	10	U																		
Anthracene	10	10	U																		
Carbazole	10	10	U																		
Di-n-butylphthalate	10	10	U																		
Fluoranthene	10	10	U																		
Pyrene	10	10	U																		
Butylbenzylphthalate	10	10	U																		
3,3'-Dichlorobenzidine	10	10	U																		
Benzo(a)anthracene	10	10	U																		
bis(2-Ethylhexyl)phthalate	10	10	U																		
Chrysene	10	10	U																		
Di-n-octylphthalate	10	10	U																		
Benzo(b)fluoranthene	10	10	U																		
Benzo(k)fluoranthene	10	10	U																		
Benzo(a)pyrene	10	10	U																		
Indeno(1,2,3-cd)pyrene	10	10	U																		
Dibenzo(a,h)anthracene	10	10	U																		
Benzo(g,h,i)perylene	10	10	U																		

NV = Not Validated

9613404.1305 WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z5																				
Sample Number		B088Z5		B08920																	
Location		199-F8-2		EB 1																	
Remarks				EB																	
Sample Date		4/12/93		4/12/93																	
Extraction Date		4/16/93		4/16/93																	
Analysis Date		5/06/93		5/05/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	10	10	U	10	U																
bis(2-Chloroethyl)ether	10	10	U	10	U																
2-Chlorophenol	10	10	U	10	U																
1,3-Dichlorobenzene	10	10	U	10	U																
1,4-Dichlorobenzene	10	10	U	10	U																
1,2-Dichlorobenzene	10	10	U	10	U																
2-Methylphenol	10	10	U	10	U																
2,2'-oxybis(1-Chloropropane)	10	10	U	10	U																
4-Methylphenol	10	10	U	10	U																
N-Nitroso-di-n-propylamine	10	10	U	10	U																
Hexachloroethane	10	10	U	10	U																
Nitrobenzene	10	10	U	10	U																
Isophorone	10	10	U	10	U																
2-Nitrophenol	10	10	U	10	U																
2,4-Dimethylphenol	10	10	U	10	U																
bis(2-Chloroethoxy)methane	10	10	U	10	U																
2,4-Dichlorophenol	10	10	U	10	U																
1,2,4-Trichlorobenzene	10	10	U	10	U																
Naphthalene	10	10	U	10	U																
4-Chloroaniline	10	10	U	10	U																
Hexachlorobutadiene	10	10	U	10	U																
4-Chloro-3-methylphenol	10	10	U	10	U																
2-Methylnaphthalene	10	10	U	10	U																
Hexachlorocyclopentadiene	10	10	U	10	U																
2,4,6-Trichlorophenol	10	10	U	10	U																
2,4,5-Trichlorophenol	50	25	U	25	U																
2-Chloronaphthalene	10	10	U	10	U																
2-Nitroaniline	50	25	U	25	U																
Dimethylphthalate	10	10	U	10	U																
Acenaphthylene	10	10	U	10	U																
3-Nitroaniline	50	25	U	25	U																
Acenaphthene	10	10	U	10	U																
2,4-Dinitrophenol	50	25	U	25	U																

EB = Equipment Blank

9613401.1508 WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z5																				
Sample Number		B088Z5		B08920																	
Location		199-F8-2		EB 1																	
Remarks				EB																	
Sample Date		4/12/93		4/12/93																	
Extraction Date		4/16/93		4/16/93																	
Analysis Date		5/06/93		5/05/93																	
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U	25	U																
Dibenzofuran	10	10	U	10	U																
2,4-Dinitrotoluene	10	10	U	10	U																
2,6-Dinitrotoluene	10	10	U	10	U																
Diethylphthalate	10	10	U	2	J																
4-Chlorophenyl-phenylether	10	10	U	10	U																
Fluorene	10	10	U	10	U																
4-Nitroaniline	50	25	U	25	U																
4,6-Dinitro-2-methylphenol	50	25	U	25	U																
N-Nitrosodiphenylamine	10	10	U	10	U																
4-Bromophenyl-phenylether	10	10	U	10	U																
Hexachlorobenzene	10	10	U	10	U																
Pentachlorophenol	50	25	U	25	U																
Phenanthrene	10	10	U	10	U																
Anthracene	10	10	U	10	U																
Carbazole	10	10	U	10	U																
Di-n-butylphthalate	10	10	U	10	U																
Fluoranthene	10	10	U	10	U																
Pyrene	10	10	U	10	U																
Butylbenzylphthalate	10	10	U	10	U																
3,3'-Dichlorobenzidine	10	10	U	10	U																
Benzo(a)anthracene	10	10	U	10	U																
bis(2-Ethylhexyl)phthalate	10	10	U	10	U																
Chrysene	10	10	U	10	U																
Di-n-octylphthalate	10	10	U	10	U																
Benzo(b)fluoranthene	10	10	U	10	U																
Benzo(k)fluoranthene	10	10	U	10	U																
Benzo(a)pyrene	10	10	U	10	U																
Indeno(1,2,3-cd)pyrene	10	10	U	10	U																
Dibenzo(a,h)anthracene	10	10	U	10	U																
Benzo(g,h,i)perylene	10	10	U	10	U																

EB = Equipment Blank

WHC-SD-EN-TI-187, Rev. 0
9613401.1507

Project: WESTINGHOUSE-HANFORD																							
Laboratory: TMA																							
Case	SDG: B08925																						
Sample Number		B08925																					
Location		EB 2																					
Remarks		NV, EB																					
Sample Date		4/13/93																					
Extraction Date		4/17/93																					
Analysis Date		5/06/93																					
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q		
Phenol	10	10	U																				
bis(2-Chloroethyl)ether	10	10	U																				
2-Chlorophenol	10	10	U																				
1,3-Dichlorobenzene	10	10	U																				
1,4-Dichlorobenzene	10	10	U																				
1,2-Dichlorobenzene	10	10	U																				
2-Methylphenol	10	10	U																				
2,2'-oxybis(1-Chloropropane)	10	10	U																				
4-Methylphenol	10	10	U																				
N-Nitroso-di-n-propylamine	10	10	U																				
Hexachloroethane	10	10	U																				
Nitrobenzene	10	10	U																				
Isophorone	10	10	U																				
2-Nitrophenol	10	10	U																				
2,4-Dimethylphenol	10	10	U																				
bis(2-Chloroethoxy)methane	10	10	U																				
2,4-Dichlorophenol	10	10	U																				
1,2,4-Trichlorobenzene	10	10	U																				
Naphthalene	10	10	U																				
4-Chloroaniline	10	10	U																				
Hexachlorobutadiene	10	10	U																				
4-Chloro-3-methylphenol	10	10	U																				
2-Methylnaphthalene	10	10	U																				
Hexachlorocyclopentadiene	10	10	U																				
2,4,6-Trichlorophenol	10	10	U																				
2,4,5-Trichlorophenol	50	25	U																				
2-Chloronaphthalene	10	10	U																				
2-Nitroaniline	50	25	U																				
Dimethylphthalate	10	10	U																				
Acenaphthylene	10	10	U																				
3-Nitroaniline	50	25	U																				
Acenaphthene	10	10	U																				
2,4-Dinitrophenol	50	25	U																				

EB = Equipment Blank, NV = Not Validated

96134UT.1308 WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B08925																				
Sample Number		B08925																			
Location		EB 2																			
Remarks		NV, EB																			
Sample Date		4/13/93																			
Extraction Date		4/17/93																			
Analysis Date		5/06/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
4-Nitrophenol	50	25	U																		
Dibenzofuran	10	10	U																		
2,4-Dinitrotoluene	10	10	U																		
2,6-Dinitrotoluene	10	10	U																		
Diethylphthalate	10	2	J																		
4-Chlorophenyl-phenylether	10	10	U																		
Fluorene	10	10	U																		
4-Nitroaniline	50	25	U																		
4,6-Dinitro-2-methylphenol	50	25	U																		
N-Nitrosodiphenylamine	10	10	U																		
4-Bromophenyl-phenylether	10	10	U																		
Hexachlorobenzene	10	10	U																		
Pentachlorophenol	50	25	U																		
Phenanthrene	10	10	U																		
Anthracene	10	10	U																		
Carbazole	10	10	U																		
Di-n-butylphthalate	10	10	U																		
Fluoranthene	10	10	U																		
Pyrene	10	10	U																		
Butylbenzylphthalate	10	10	U																		
3,3'-Dichlorobenzidine	10	10	U																		
Benzo(a)anthracene	10	10	U																		
bis(2-Ethylhexyl)phthalate	10	10	U																		
Chrysene	10	10	U																		
Di-n-octylphthalate	10	10	U																		
Benzo(b)fluoranthene	10	10	U																		
Benzo(k)fluoranthene	10	10	U																		
Benzo(a)pyrene	10	10	U																		
Indeno(1,2,3-cd)pyrene	10	10	U																		
Dibenz(a,h)anthracene	10	10	U																		
Benzo(g,h,i)perylene	10	10	U																		

EB = Equipment Blank, NV = Not Validated

9613401.1609

WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B08930																				
Sample Number		B08930																			
Location		199-F5-47																			
Remarks		Split, NV																			
Sample Date		4/07/93																			
Extraction Date		4/13/93																			
Analysis Date		4/28/93																			
Semivolatile Compound	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
2,4-Dinitrophenol	50	25	U																		
4-Nitrophenol	50	25	U																		
Dibenzofuran	10	10	U																		
2,4-Dinitrotoluene	10	10	U																		
Diethylphthalate	10	10	U																		
4-Chlorophenyl-phenylether	10	10	U																		
Fluorene	10	10	U																		
4-Nitroaniline	50	25	U																		
4,6-Dinitro-2-methylphenol	50	25	U																		
N-Nitrosodiphenylamine	10	10	U																		
4-Bromophenyl-phenylether	10	10	U																		
Hexachlorobenzene	10	10	U																		
Pentachlorophenol	50	25	U																		
Phenanthrene	10	10	U																		
Anthracene	10	10	U																		
Carbazole	10	10	U																		
Di-n-butylphthalate	10	10	U																		
Fluoranthene	10	10	U																		
Pyrene	10	10	U																		
Butylbenzylphthalate	10	10	U																		
3,3'-Dichlorobenzidine	10	10	U																		
Benzo(a)anthracene	10	10	U																		
bis(2-Ethylhexyl)phthalate	10	10	U																		
Chrysene	10	10	U																		
Di-n-octylphthalate	10	10	U																		
Benzo(b)fluoranthene	10	10	U																		
Benzo(k)fluoranthene	10	10	U																		
Benzo(a)pyrene	10	10	U																		
Indeno(1,2,3-cd)pyrene	10	10	U																		
Dibenz(a,h)anthracene	10	10	U																		
Benzo(g,h,i)perylene	10	10	U																		

NV = Not Validated

9613401.1310 WHC-SD-EN-TI-187, Rev. 0

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	PESTICIDES/ PCBs
199-F5-45	B088P6	W	03/31/93	V	4-5
199-F1-2	B088Q0	W	04/02/93	NV	4-6
199-F5-1	B088Q5	W	03/31/93	V	4-7
199-F5-3	B088R0	W	04/07/93	NV	4-8
199-F5-4	B088R5	W	04/05/93	NV	4-9
199-F5-6	B088S5	W	04/07/93	NV	4-8
199-F5-42	B088T0	W	04/05/93	NV	4-9
199-F5-43A	B088T5	W	04/06/93	NV	4-10
199-F5-44	B088V0	W	04/01/93	NV	4-11
199-F5-45	B088V5	W	03/31/93	V	4-7
199-F5-46	B088W0	W	04/03/93	NV	4-6
199-F5-47	B088W5	W	04/07/93	NV	4-8
199-F5-48	B088X0	W	04/03/93	NV	4-6
199-F6-1	B088X5	W	04/06/93	NV	4-10
199-F7-1	B088Y0	W	03/31/93	V	4-7
199-F7-2	B088Y5	W	04/08/93	NV	4-12
199-F7-3	B088Z0	W	04/09/93	NV	4-13
199-F8-2	B088Z5	W	04/12/93	V	4-14
199-F8-3	B08900	W	04/03/93	NV	4-6
199-F8-4	B08905	W	04/08/93	NV	4-12
199-F5-45	B08910	W	03/31/93	V	4-7
199-F5-47	B08915	W	04/07/93	NV	4-8
EB 1	B08920	W	04/12/93	V	4-14
EB 2	B08925	W	04/13/93	NV	4-17
199-F5-47	B08930	W	04/07/93	NV	4-18

4.0 PESTICIDE AND PCB DATA VALIDATION

4.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6 B088Q5 B088Z5

4.2 HOLDING TIMES

Analytical holding times were assessed to ascertain whether the holding time requirements for pesticide/PCB analyses were met by the laboratory. Westinghouse-Hanford procedures require that samples be extracted within seven days of collection and analyzed within 40 days of extraction (WHC 1991a).

Holding time requirements were met for all samples.

4.3 INSTRUMENT PERFORMANCE AND CALIBRATIONS

Instrument performance was assessed to ensure that adequate chromatographic resolution and instrument sensitivity were achieved by the gas chromatographic system.

The specific criteria for acceptable instrument performance are outlined in EPA guidelines (EPA 1988a and 1988b), including the evaluation and qualification procedures that may be performed on the analytical results.

During the quality assurance review, all indicators for acceptable instrument performance were verified. The criteria established by CLP protocols were met and the results are acceptable, except as noted.

Instrument calibration is performed to ensure that the chromatographic system is capable of producing acceptable and reliable analytical data. The initial and continuing calibrations are to be performed according to procedures established by CLP protocols. An initial calibration is performed prior to sample analysis to establish the linear range of the system, including a demonstration that all target compounds can be detected. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

4.3.1 Initial Calibrations

The laboratory performed an initial multipoint calibration for all target compounds at the concentrations required by CLP protocols. The linearity of the initial calibration is established when the percent RSD or the calibration factors are less than or equal to 10 percent (or 15% for certain analytes).

All initial calibration results were acceptable.

4.3.2 Calibration Verification

The criteria for acceptable continuing calibrations requires that the calibration factors for all target compounds have a percent difference of less than or equal to 15 percent of the average calibration factor calculated for the associated initial calibration standard. The 15 percent difference value is required for results calculated using the chromatographic column which is used for quantitative purposes. In addition, the percent difference of the calibration factors calculated for the chromatographic column that is used for confirmation must be less than or equal to 20 percent.

All calibration verification results were acceptable.

4.4 BLANKS

Method blank and field blank analyses are performed to determine the extent of laboratory or field contamination of samples. No contaminants should be present in the blanks. Analytical results for analytes present in any sample at less than 5 times the concentration of that analyte found in associated blanks should be qualified as non-detects.

There were no compounds of concern detected in the method or field blanks.

4.5 ACCURACY

Accuracy was assessed by evaluating the recoveries of the surrogate compounds and the matrix spike recoveries calculated for the sample analyses.

4.5.1 Matrix Spike Recovery

Matrix spike analyses are performed in duplicate using six compounds specified by CLP protocols. The recoveries for the six compounds must be within the acceptable quality control limits established by CLP protocols.

All matrix spike/matrix spike duplicate results were acceptable.

4.5.2 Surrogate Recovery

Surrogate compound recoveries are calculated using analytical results from two stable surrogate compounds added to the sample prior to sample preparation and analysis. Matrix-specific surrogate compound recovery control windows have been established by the EPA CLP program. When recoveries for either surrogate compound are out of the control window, all positively identified target compound concentrations in samples associated with the unacceptable surrogate recoveries are qualified as estimates (J) and undetected compounds are qualified estimated below the detection limit (UJ).

Sample number B08920 in SDG No. B088Z5 exhibited 0% recovery on both columns for the surrogate compound tetrachloro-m-xylene. The sample was reanalyzed; however incomplete reanalysis data was submitted and an improper analysis sequence used. Therefore, all results for sample B08920 were rejected and flagged "R".

Surrogate recovery results were acceptable for all samples.

4.6 PRECISION

Precision is expressed by the RPD between the recoveries of the matrix spike and the matrix spike duplicate analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed by using unspiked duplicate analyses.

All matrix spike/matrix spike duplicate RPDs were acceptable.

4.7 COMPOUND IDENTIFICATION AND QUANTITATION

The data were evaluated to confirm the positive concentrations and to investigate the possibility of false negatives in all other data. Confirmation of possible false negatives is addressed by reviewing other factors relating to analytical sensitivity (e.g., detection limits, instrument linearity, analytical recovery). These factors were found to be in control, and the data are acceptable.

All compound identifications and quantitation results were acceptable.

4.7.1 Reported Quantitation Limits

Compound quantitations and reported detection limits were recalculated and verified for a minimum of 20 percent of the samples in each case to ensure that they were accurate and are consistent with CLP requirements (EPA 1988a). The reported detection limits must be in accordance with the CRQLs specified in the applicable CLP statement of work.

The compound quantitations and the CRQLs reported were calculated correctly and were acceptable.

4.8 OVERALL ASSESSMENT AND SUMMARY

A thorough review of ongoing data acquisition and instrument performance criteria was made to assess overall GC/MS instrument performance. No changes in instrument performance were noted that would result in the degradation of data quality. No indications of unacceptable instrument performance (i.e., shifts in baseline stability, retention time shifts, extraneous peaks, or sensitivity) were found during the quality assurance review.

In general, the pesticide/PCB data presented in this report met the protocol-specified QA/QC requirements. The surrogate recovery for tetrachloro-m-xylene was 0% on both columns for one sample. All associated results were rejected and flagged "R". Rejected data are unusable for all purposes. All other data are considered valid and usable within the standard error associated with the method.

PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B088P6																				
Sample Number		B088P6																			
Location		199-F5-45																			
Remarks		Split																			
Sample Date		3/31/93																			
Extraction Date		4/05/93																			
Analysis Date		4/29/93																			
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.050	U																		
beta-BHC	0.05	0.050	U																		
delta-BHC	0.05	0.050	U																		
gamma-BHC (Lindane)	0.05	0.050	U																		
Heptachlor	0.05	0.050	U																		
Aldrin	0.05	0.050	U																		
Heptachlor epoxide	0.05	0.050	U																		
Endosulfan I	0.05	0.050	U																		
Dieldrin	0.10	0.10	U																		
4,4'-DDE	0.10	0.10	U																		
Endrin	0.10	0.10	U																		
Endosulfan II	0.10	0.10	U																		
4,4'-DDD	0.10	0.10	U																		
Endosulfan sulfate	0.10	0.10	U																		
4,4'-DDT	0.10	0.10	U																		
Methoxychlor	0.50	0.50	U																		
Endrin Ketone	0.10	0.10	U																		
Endrin Aldehyde	0.10	0.10	U																		
alpha-Chlordane	0.05	0.050	U																		
gamma-Chlordane	0.05	0.050	U																		
Toxaphene	5.00	5.0	U																		
Aroclor-1016	1.00	1.0	U																		
Aroclor-1221	1.00	2.0	U																		
Aroclor-1232	2.00	1.0	U																		
Aroclor-1242	1.00	1.0	U																		
Aroclor-1248	1.00	1.0	U																		
Aroclor-1254	1.00	1.0	U																		
Aroclor-1260	1.00	1.0	U																		

9613401.1516
WHC-SD-EN-TI-187, Rev. 0

PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q0																				
Sample Number		B088Q0		B088W0		B088X0		B08900													
Location		199-F1-2		199-F5-46		199-F5-48		199-F8-3													
Remarks		NV		NV		NV		NV													
Sample Date		4/02/93		4/03/93		4/03/93		4/03/93													
Extraction Date		4/08/93		4/08/93		4/08/93		4/08/93													
Analysis Date		4/18/93		4/18/93		4/18/93		4/18/93													
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
beta-BHC	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
delta-BHC	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
gamma-BHC (Lindane)	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Heptachlor	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Aldrin	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Heptachlor epoxide	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Endosulfan I	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Dieldrin	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
4,4'-DDE	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endrin	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endosulfan II	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
4,4'-DDD	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endosulfan sulfate	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
4,4'-DDT	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Methoxychlor	0.50	0.50	U	0.50	U	0.50	U	0.50	U												
Endrin Ketone	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endrin Aldehyde	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
alpha-Chlordane	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
gamma-Chlordane	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Toxaphene	5.00	5.00	U	5.00	U	5.00	U	5.00	U												
Aroclor-1016	1.00	1.00	U	1.00	U	1.00	U	1.00	U												
Aroclor-1221	1.00	2.00	U	2.00	U	2.00	U	2.00	U												
Aroclor-1232	2.00	1.00	U	1.00	U	1.00	U	1.00	U												
Aroclor-1242	1.00	1.00	U	1.00	U	1.00	U	1.00	U												
Aroclor-1248	1.00	1.00	U	1.00	U	1.00	U	1.00	U												
Aroclor-1254	1.00	1.00	U	1.00	U	1.00	U	1.00	U												
Aroclor-1260	1.00	1.00	U	1.00	U	1.00	U	1.00	U												

NV = Not Validated

9613401.1464 SD-EN-TI-187, Rev. 0

PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																				
Laboratory: TMA																				
Case	SDG: B088Q5																			
Sample Number		B088Q5		B088V5		B088Y0		B08910												
Location		199-F5-1		199-F5-45		199-F7-1		199-F5-45												
Remarks								DUP												
Sample Date		3/31/93		3/31/93		3/31/93		3/31/93												
Extraction Date		4/05/93		4/05/93		4/05/93		4/05/93												
Analysis Date		4/18/93		4/18/93		4/18/93		4/18/93												
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.050	U	0.050	U	0.050	U	0.050	U											
beta-BHC	0.05	0.050	U	0.050	U	0.050	U	0.050	U											
delta-BHC	0.05	0.050	U	0.050	U	0.050	U	0.050	U											
gamma-BHC (Lindane)	0.05	0.050	U	0.050	U	0.050	U	0.050	U											
Heptachlor	0.05	0.050	U	0.050	U	0.050	U	0.050	U											
Aldrin	0.05	0.050	U	0.050	U	0.050	U	0.050	U											
Heptachlor epoxide	0.05	0.050	U	0.050	U	0.050	U	0.050	U											
Endosulfan I	0.05	0.050	U	0.050	U	0.050	U	0.050	U											
Dieldrin	0.10	0.10	U	0.10	U	0.10	U	0.10	U											
4,4'-DDE	0.10	0.10	U	0.10	U	0.10	U	0.10	U											
Endrin	0.10	0.10	U	0.10	U	0.10	U	0.10	U											
Endosulfan II	0.10	0.10	U	0.10	U	0.10	U	0.10	U											
4,4'-DDD	0.10	0.10	U	0.10	U	0.10	U	0.10	U											
Endosulfan sulfate	0.10	0.10	U	0.10	U	0.10	U	0.10	U											
4,4'-DDT	0.10	0.10	U	0.10	U	0.10	U	0.10	U											
Methoxychlor	0.50	0.50	U	0.50	U	0.50	U	0.50	U											
Endrin Ketone	0.10	0.10	U	0.10	U	0.10	U	0.10	U											
Endrin Aldehyde	0.10	0.10	U	0.10	U	0.10	U	0.10	U											
alpha-Chlordane	0.05	0.050	U	0.050	U	0.050	U	0.050	U											
gamma-Chlordane	0.05	0.050	U	0.050	U	0.050	U	0.050	U											
Toxaphene	5.00	5.00	U	5.00	U	5.00	U	5.00	U											
Aroclor-1016	1.00	1.00	U	1.00	U	1.00	U	1.00	U											
Aroclor-1221	1.00	2.00	U	2.00	U	2.00	U	2.00	U											
Aroclor-1232	2.00	1.00	U	1.00	U	1.00	U	1.00	U											
Aroclor-1242	1.00	1.00	U	1.00	U	1.00	U	1.00	U											
Aroclor-1248	1.00	1.00	U	1.00	U	1.00	U	1.00	U											
Aroclor-1254	1.00	1.00	U	1.00	U	1.00	U	1.00	U											
Aroclor-1260	1.00	1.00	U	1.00	U	1.00	U	1.00	U											

DUP = Duplicate

9613401.1518

PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R0																				
Sample Number		B088R0		B088S5		B088W5		B08915													
Location		199-F5-3		199-F5-6		199-F5-47		199-F5-47													
Remarks		NV		NV		NV		DUP, NV													
Sample Date		4/07/93		4/07/93		4/07/93		4/07/93													
Extraction Date		4/12/93		4/12/93		4/12/93		4/12/93													
Analysis Date		4/18/93		4/19/93		4/19/93		4/19/93													
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
beta-BHC	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
delta-BHC	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
gamma-BHC (Lindane)	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Heptachlor	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Aldrin	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Heptachlor epoxide	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Endosulfan I	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Dieldrin	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
4,4'-DDE	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endrin	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endosulfan II	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
4,4'-DDD	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endosulfan sulfate	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
4,4'-DDT	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Methoxychlor	0.50	0.50	U	0.50	U	0.50	U	0.50	U												
Endrin Ketone	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
Endrin Aldehyde	0.10	0.10	U	0.10	U	0.10	U	0.10	U												
alpha-Chlordane	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
gamma-Chlordane	0.05	0.050	U	0.050	U	0.050	U	0.050	U												
Toxaphene	5.00	5.00	U	5.00	U	5.00	U	5.00	U												
Aroclor-1016	1.00	1.00	U	1.00	U	1.00	U	1.00	U												
Aroclor-1221	1.00	2.00	U	2.00	U	2.00	U	2.00	U												
Aroclor-1232	2.00	1.00	U	1.00	U	1.00	U	1.00	U												
Aroclor-1242	1.00	1.00	U	1.00	U	1.00	U	1.00	U												
Aroclor-1248	1.00	1.00	U	1.00	U	1.00	U	1.00	U												
Aroclor-1254	1.00	1.00	U	1.00	U	1.00	U	1.00	U												
Aroclor-1260	1.00	1.00	U	1.00	U	1.00	U	1.00	U												

NV = Not Validated, DUP = Duplicate

9613401.1519

PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R5																				
Sample Number		B088R5		B088T0																	
Location		199-F5-4		199-F5-42																	
Remarks		NV		NV																	
Sample Date		4/05/93		4/05/93																	
Extraction Date		4/08/93		4/08/93																	
Analysis Date		4/21/93		4/21/93																	
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.050	U	0.050	U																
beta-BHC	0.05	0.050	U	0.050	U																
delta-BHC	0.05	0.050	U	0.050	U																
gamma-BHC (Lindane)	0.05	0.050	U	0.050	U																
Heptachlor	0.05	0.050	U	0.050	U																
Aldrin	0.05	0.050	U	0.050	U																
Heptachlor epoxide	0.05	0.050	U	0.050	U																
Endosulfan I	0.05	0.050	U	0.050	U																
Dieldrin	0.10	0.10	U	0.10	U																
4,4'-DDE	0.10	0.10	U	0.10	U																
Endrin	0.10	0.10	U	0.10	U																
Endosulfan II	0.10	0.10	U	0.10	U																
4,4'-DDD	0.10	0.10	U	0.10	U																
Endosulfan sulfate	0.10	0.10	U	0.10	U																
4,4'-DDT	0.10	0.10	U	0.10	U																
Methoxychlor	0.50	0.50	U	0.50	U																
Endrin Ketone	0.10	0.10	U	0.10	U																
Endrin Aldehyde	0.10	0.10	U	0.10	U																
alpha-Chlordane	0.05	0.050	U	0.050	U																
gamma-Chlordane	0.05	0.050	U	0.050	U																
Toxaphene	5.00	5.00	U	5.00	U																
Aroclor-1016	1.00	1.00	U	1.00	U																
Aroclor-1221	1.00	2.00	U	2.00	U																
Aroclor-1232	2.00	1.00	U	1.00	U																
Aroclor-1242	1.00	1.00	U	1.00	U																
Aroclor-1248	1.00	1.00	U	1.00	U																
Aroclor-1254	1.00	1.00	U	1.00	U																
Aroclor-1260	1.00	1.00	U	1.00	U																

NV = Not Validated

PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088V0																				
Sample Number		B088V0																			
Location		199-F5-44																			
Remarks		NV																			
Sample Date		4/01/93																			
Extraction Date		4/06/93																			
Analysis Date		4/18/93																			
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.050	U																		
beta-BHC	0.05	0.050	U																		
delta-BHC	0.05	0.050	U																		
gamma-BHC (Lindane)	0.05	0.050	U																		
Heptachlor	0.05	0.050	U																		
Aldrin	0.05	0.050	U																		
Heptachlor epoxide	0.05	0.050	U																		
Endosulfan I	0.05	0.050	U																		
Dieldrin	0.10	0.10	U																		
4,4'-DDE	0.10	0.10	U																		
Endrin	0.10	0.10	U																		
Endosulfan II	0.10	0.10	U																		
4,4'-DDD	0.10	0.10	U																		
Endosulfan sulfate	0.10	0.10	U																		
4,4'-DDT	0.10	0.10	U																		
Methoxychlor	0.50	0.50	U																		
Endrin Ketone	0.10	0.10	U																		
Endrin Aldehyde	0.10	0.10	U																		
alpha-Chlordane	0.05	0.050	U																		
gamma-Chlordane	0.05	0.050	U																		
Toxaphene	5.00	5.0	U																		
Aroclor-1016	1.00	1.0	U																		
Aroclor-1221	1.00	2.0	U																		
Aroclor-1232	2.00	1.0	U																		
Aroclor-1242	1.00	1.0	U																		
Aroclor-1248	1.00	1.0	U																		
Aroclor-1254	1.00	1.0	U																		
Aroclor-1260	1.00	1.0	U																		

NV = Not Validated

9613401.1624
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PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Y5																				
Sample Number		B088Y5		B08905																	
Location		199-F7-2		199-F8-4																	
Remarks		NV		NV																	
Sample Date		4/08/93		4/08/93																	
Extraction Date		4/13/93		4/13/93																	
Analysis Date		4/19/93		4/19/93																	
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.050	U	0.050	U																
beta-BHC	0.05	0.050	U	0.050	U																
delta-BHC	0.05	0.050	U	0.050	U																
gamma-BHC (Lindane)	0.05	0.050	U	0.050	U																
Heptachlor	0.05	0.050	U	0.050	U																
Aldrin	0.05	0.050	U	0.050	U																
Heptachlor epoxide	0.05	0.050	U	0.050	U																
Endosulfan I	0.05	0.050	U	0.050	U																
Dieldrin	0.10	0.10	U	0.10	U																
4,4'-DDE	0.10	0.10	U	0.10	U																
Endrin	0.10	0.10	U	0.10	U																
Endosulfan II	0.10	0.10	U	0.10	U																
4,4'-DDD	0.10	0.10	U	0.10	U																
Endosulfan sulfate	0.10	0.10	U	0.10	U																
4,4'-DDT	0.10	0.10	U	0.10	U																
Methoxychlor	0.50	0.50	U	0.50	U																
Endrin Ketone	0.10	0.10	U	0.10	U																
Endrin Aldehyde	0.10	0.10	U	0.10	U																
alpha-Chlordane	0.05	0.050	U	0.050	U																
gamma-Chlordane	0.05	0.050	U	0.050	U																
Toxaphene	5.00	5.00	U	5.00	U																
Aroclor-1016	1.00	1.00	U	1.00	U																
Aroclor-1221	1.00	2.00	U	2.00	U																
Aroclor-1232	2.00	1.00	U	1.00	U																
Aroclor-1242	1.00	1.00	U	1.00	U																
Aroclor-1248	1.00	1.00	U	1.00	U																
Aroclor-1254	1.00	1.00	U	1.00	U																
Aroclor-1260	1.00	1.00	U	1.00	U																

NV = Not Validated

9613401.1622
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PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z0																				
Sample Number		B088Z0																			
Location		199-F7-3																			
Remarks		NV																			
Sample Date		4/09/93																			
Extraction Date		4/14/93																			
Analysis Date		4/18/93																			
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.050	U																		
beta-BHC	0.05	0.050	U																		
delta-BHC	0.05	0.050	U																		
gamma-BHC (Lindane)	0.05	0.050	U																		
Heptachlor	0.05	0.050	U																		
Aldrin	0.05	0.050	U																		
Heptachlor epoxide	0.05	0.050	U																		
Endosulfan I	0.05	0.050	U																		
Dieldrin	0.10	0.10	U																		
4,4'-DDE	0.10	0.10	U																		
Endrin	0.10	0.10	U																		
Endosulfan II	0.10	0.10	U																		
4,4'-DDD	0.10	0.10	U																		
Endosulfan sulfate	0.10	0.10	U																		
4,4'-DDT	0.10	0.10	U																		
Methoxychlor	0.50	0.50	U																		
Endrin Ketone	0.10	0.10	U																		
Endrin Aldehyde	0.10	0.10	U																		
alpha-Chlordane	0.05	0.050	U																		
gamma-Chlordane	0.05	0.050	U																		
Toxaphene	5.00	5.00	U																		
Aroclor-1016	1.00	1.00	U																		
Aroclor-1221	1.00	2.00	U																		
Aroclor-1232	2.00	1.00	U																		
Aroclor-1242	1.00	1.00	U																		
Aroclor-1248	1.00	1.00	U																		
Aroclor-1254	1.00	1.00	U																		
Aroclor-1260	1.00	1.00	U																		

NV = Not Validated

9613401.1523
WHC-SD-EN-TI-187, Rev. 0

PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z5																				
Sample Number		B088Z5		B08920																	
Location		199-F8-2		EB 1																	
Remarks				EB																	
Sample Date		4/12/93		4/12/93																	
Extraction Date		4/16/93		4/16/93																	
Analysis Date		4/30/93		4/30/93																	
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.050	U	0.050	R																
beta-BHC	0.05	0.050	U	0.050	R																
delta-BHC	0.05	0.050	U	0.050	R																
gamma-BHC (Lindane)	0.05	0.050	U	0.050	R																
Heptachlor	0.05	0.050	U	0.050	R																
Aldrin	0.05	0.050	U	0.050	R																
Heptachlor epoxide	0.05	0.050	U	0.050	R																
Endosulfan I	0.05	0.050	U	0.050	R																
Dieldrin	0.10	0.10	U	0.10	R																
4,4'-DDE	0.10	0.10	U	0.10	R																
Endrin	0.10	0.10	U	0.10	R																
Endosulfan II	0.10	0.10	U	0.10	R																
4,4'-DDD	0.10	0.10	U	0.10	R																
Endosulfan sulfate	0.10	0.10	U	0.10	R																
4,4'-DDT	0.10	0.10	U	0.10	R																
Methoxychlor	0.50	0.50	U	0.50	R																
Endrin Ketone	0.10	0.10	U	0.10	R																
Endrin Aldehyde	0.10	0.10	U	0.10	R																
alpha-Chlordane	0.05	0.050	U	0.050	R																
gamma-Chlordane	0.05	0.050	U	0.050	R																
Toxaphene	5.00	5.0	U	5.0	R																
Aroclor-1016	1.00	1.0	U	1.0	R																
Aroclor-1221	1.00	2.0	U	2.0	R																
Aroclor-1232	2.00	1.0	U	1.0	R																
Aroclor-1242	1.00	1.0	U	1.0	R																
Aroclor-1248	1.00	1.0	U	1.0	R																
Aroclor-1254	1.00	1.0	U	1.0	R																
Aroclor-1260	1.00	1.0	U	1.0	R																

EB = Equipment Blank

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ACCURACY DATA SUMMARY

SDG: B088Z5	REVIEWER: KG	DATE: 7/19/93	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B08920	Tetrachloro-m-xylene	0%/0%	B08920	R

DATA QUALIFICATION SUMMARY

SDG: B088Z5	REVIEWER: KG	DATE: 7/19/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
All Pest/PCB analytes	R	B08920	0% Surrogate recovery

PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B08925																				
Sample Number		B08925																			
Location		EB 2																			
Remarks		NV, EB																			
Sample Date		4/13/93																			
Extraction Date		4/17/93																			
Analysis Date		4/30/93																			
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
alpha-BHC	0.05	0.050	U																		
beta-BHC	0.05	0.050	U																		
delta-BHC	0.05	0.050	U																		
gamma-BHC (Lindane)	0.05	0.050	U																		
Heptachlor	0.05	0.050	U																		
Aldrin	0.05	0.050	U																		
Heptachlor epoxide	0.05	0.050	U																		
Endosulfan I	0.05	0.050	U																		
Dieldrin	0.10	0.10	U																		
4,4'-DDE	0.10	0.10	U																		
Endrin	0.10	0.10	U																		
Endosulfan II	0.10	0.10	U																		
4,4'-DDD	0.10	0.10	U																		
Endosulfan sulfate	0.10	0.10	U																		
4,4'-DDT	0.10	0.10	U																		
Methoxychlor	0.50	0.50	U																		
Endrin Ketone	0.10	0.10	U																		
Endrin Aldehyde	0.10	0.10	U																		
alpha-Chlordane	0.05	0.050	U																		
gamma-Chlordane	0.05	0.050	U																		
Toxaphene	5.00	5.00	U																		
Aroclor-1016	1.00	1.00	U																		
Aroclor-1221	1.00	2.00	U																		
Aroclor-1232	2.00	1.00	U																		
Aroclor-1242	1.00	1.00	U																		
Aroclor-1248	1.00	1.00	U																		
Aroclor-1254	1.00	1.00	U																		
Aroclor-1260	1.00	1.00	U																		

EB = Equipment Blank, NV = Not Validated

9613401.1627
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PESTICIDE/PCB ORGANIC ANALYSIS, WATER MATRIX, (ug/L)

Project: WESTINGHOUSE-HANFORD																						
Laboratory: Roy F. Weston																						
Case	SDG: B08930																					
Sample Number		B08930																				
Location		199-F5-47																				
Remarks		Split, NV																				
Sample Date		4/07/93																				
Extraction Date		4/12/93																				
Analysis Date		4/22/93																				
Pesticide/PCB	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	
alpha-BHC	0.05	0.050	U																			
beta-BHC	0.05	0.050	U																			
delta-BHC	0.05	0.050	U																			
gamma-BHC (Lindane)	0.05	0.050	U																			
Heptachlor	0.05	0.050	U																			
Aldrin	0.05	0.050	U																			
Heptachlor epoxide	0.05	0.050	U																			
Endosulfan I	0.05	0.050	U																			
Dieldrin	0.10	0.10	U																			
4,4'-DDE	0.10	0.10	U																			
Endrin	0.10	0.10	U																			
Endosulfan II	0.10	0.10	U																			
4,4'-DDD	0.10	0.10	U																			
Endosulfan sulfate	0.10	0.10	U																			
4,4'-DDT	0.10	0.10	U																			
Methoxychlor	0.50	0.50	U																			
Endrin Ketone	0.10	0.10	U																			
Endrin Aldehyde	0.10	0.10	U																			
alpha-Chlordane	0.05	0.050	U																			
gamma-Chlordane	0.05	0.050	U																			
Toxaphene	5.00	5.0	U																			
Aroclor-1016	1.00	1.0	U																			
Aroclor-1221	1.00	2.0	U																			
Aroclor-1232	2.00	1.0	U																			
Aroclor-1242	1.00	1.0	U																			
Aroclor-1248	1.00	1.0	U																			
Aroclor-1254	1.00	1.0	U																			
Aroclor-1260	1.00	1.0	U																			

NV = Not Validated

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WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	INORGANICS
199-F5-45	B088P6	W	03/31/93	V	5-10
	B088P7	W	03/31/93	V	5-10
199-F1-2	B088Q0	W	04/02/93	NV	5-14
	B088Q1	W	04/02/93	NV	5-15
199-F5-1	B088Q5	W	03/31/93	V	5-16
	B088Q6	W	03/31/93	V	5-20
199-F5-3	B088R0	W	04/07/93	NV	5-25
	B088R1	W	04/07/93	NV	5-26
199-F5-4	B088R5	W	04/05/93	NV	5-27
	B088R6	W	04/05/93	NV	5-28
199-F5-6	B088S5	W	04/07/93	NV	5-25
	B088S6	W	04/07/93	NV	5-26
199-F5-42	B088T0	W	04/05/93	NV	5-27
	B088T1	W	04/05/93	NV	5-28
199-F5-43A	B088T5	W	04/06/93	NV	5-29
	B088T6	W	04/06/93	NV	5-30
199-F5-44	B088V0	W	04/01/93	NV	5-31
	B088V1	W	04/01/93	NV	5-31
199-F5-45	B088V5	W	03/31/93	V	5-16
	B088V6	W	03/31/93	V	5-20
199-F5-46	B088W0	W	04/03/93	NV	5-14
	B088W1	W	04/03/93	NV	5-15
199-F5-47	B088W5	W	04/07/93	NV	5-25
	B088W6	W	04/07/93	NV	5-26
199-F5-48	B088X0	W	04/03/93	NV	5-14
	B088X1	W	04/03/93	NV	5-15
199-F6-1	B088X5	W	04/06/93	NV	5-29
	B088X6	W	04/06/93	NV	5-30
199-F7-1	B088Y0	W	03/31/93	V	5-16
	B088Y1	W	03/31/93	V	5-20
199-F7-2	B088Y5	W	04/08/93	NV	5-33
	B088Y6	W	04/08/93	NV	5-34
199-F7-3	B088Z0	W	04/09/93	NV	5-35
	B088Z1	W	04/09/93	NV	5-36

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	INORGANICS
199-F8-2	B088Z5	W	04/12/93	V	5-37
	B088Z6	W	04/12/93	V	5-42
199-F8-3	B08900	W	04/03/93	NV	5-14
	B08901	W	04/03/93	NV	5-15
199-F8-4	B08905	W	04/08/93	NV	5-33
	B08906	W	04/08/93	NV	5-34
199-F5-45	B08910	W	03/31/93	V	5-16
	B08911	W	03/31/93	V	5-20
199-F5-47	B08915	W	04/07/93	NV	5-25
	B08916	W	04/07/93	NV	5-26
EB 1	B08920	W	04/12/93	V	5-37
	B08921	W	04/12/93	V	5-42
EB 2	B08925	W	04/13/93	NV	5-47
	B08926	W	04/13/93	NV	5-48
199-F5-47	B08930	W	04/07/93	NV	5-49
	B08931	W	04/07/93	NV	5-49

5.0 INORGANIC DATA VALIDATION

5.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6 B088Q5 B088Q6 B088Z5 B088Z6

5.2 HOLDING TIMES

Analytical holding times for ICP metals, GFAA metals and CVAA mercury analyses were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: samples must be analyzed within twenty-eight days for mercury, 14 days for cyanide and within six months for all other metals.

All holding time requirements for all analytes in all data packages reviewed were met.

5.3 INSTRUMENT PERFORMANCE AND CALIBRATIONS

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

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

Up to five calibration standards and a blank were analyzed for mercury by CVAA. The correlation coefficient of a least squares linear regression met the requirements for calibration.

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

The above calibrations were each immediately verified with an ICV standard and a calibration blank. The ICV was prepared from a source independent of the calibration standards, at a mid-calibration range concentration. The ICV percent recovery must fall within the control limits of 90 to 110 percent for metals analyzed by ICP and GFAA, and 80 to 150 percent for

mercury. Calibration linearity near the detection limit was verified with a standard prepared at a concentration near the CRDL.

The ICVs met the recommended control limits in all cases.

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

The CCVs met the recommended control limits in all cases.

5.3.1 ICP Calibration

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

A five-fold serial dilution is required for all elements analyzed by ICP. The subsequent concentrations of the reanalysis are compared with the original analysis. If the analyte concentration is sufficiently high (a minimum factor of 50 above the IDL) then the serial dilution must agree within 10% of the original determination after correction for dilution.

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

5.3.5 Atomic Absorption Calibrations

Duplicate injections are required for all GFAA analyses. The duplicate injections establish the precision of the individual analytical determinations. For sample concentrations greater than the CRDL, duplicate injections must agree within ±50 percent RSD.

5.4 BLANKS

Samples with digestate concentrations (in ug/L) of less than five times (<5x) the highest amount found in any of the associated blanks have had their associated values qualified as non-detected (U). Samples with concentrations of greater than five times (>5x) the highest amount found in any of the associated blanks do not require qualification.

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for aluminum:

- All samples in SDG No. B088Q5.

- Sample number B08911 in SDG No. B088Q6.
- Sample number B088Z5 in SDG No. B088Z5.
- Sample number B08921 in SDG NO. B088Z6.

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for arsenic:

- All samples in SDG No. B088P6

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for copper:

- Sample numbers B088Q5 and B08910 in SDG No. B088Q5.

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for iron:

- All samples in SDG No. B088P6.
- Sample numbers B088V5, B088Y0 and B08910 in SDG No. B088Q5.
- Sample numbers B088Q6 and B08911 in SDG No. B088Q6.
- Sample numbers B088Z5 and B08920 in SDG No. B088Z5.

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for manganese:

- All samples in SDG No. B088Q5.

Due to the presence of laboratory blank contamination, the following sample was flagged "U" for sodium:

- Sample number B08921 in SDG No. B088Z6.

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for vanadium:

- All samples in SDG No. B088P6.
- Sample numbers B088V5 and B08910 in SDG No. B088Q5.

Due to the presence of laboratory blank contamination, the following samples were flagged "U" for zinc:

- Sample number B088P6 in SDG No. B088P6.
- Sample numbers B088Q6, B088Y1 and B08911 in SDG No. B088Q6.

All other laboratory blank results were acceptable.

5.5 ACCURACY

5.5.1 Matrix Spike Recovery

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations. Matrix spike recoveries must generally fall within the range of 75 to 155 percent. Samples with a spike recovery of less than 30% and a sample value below the IDL were rejected and flagged "R". All other samples with a spike recovery outside the QC limits are qualified as estimates and flagged "J".

The matrix spike recovery fell outside the QC limits and the associated results flagged "J" for arsenic in the following samples:

- All samples in SDG No. B088P6.
- All samples in SDG No. B088Q5.

The matrix spike recovery fell outside the QC limits and the associated results flagged "J" for selenium in the following samples:

- All samples in SDG No. B088Q5.

All other matrix spike recovery results were acceptable.

5.5.5 Laboratory Control Sample Recovery

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

One liquid LCS was digested and analyzed for each of the cases in this report that contained water samples. The results were compared against the control limit of 80-150% as required by the EPA CLP SOW 3/90 protocol and found to be acceptable.

All LCSW results were found to be acceptable.

5.6 PRECISION

5.6.1 Laboratory Duplicate Samples

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

The laboratory duplicate RPD results were above QC limits and the associated results flagged "J" for selenium in all samples in SDG No. B088Q6.

All other laboratory duplicate recovery results were acceptable.

5.6.5 ICP Serial Dilution

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

All ICP serial dilution results were acceptable.

5.6.3 Total and Dissolved Sample Analysis

Inorganics parameters included the analysis of total as well as dissolved samples. Total samples include particulate and dissolved fractions while dissolved samples are first filtered prior to preparation. The purpose of the analysis is to determine the percent difference between the results of the dissolved (filtered) samples vs. the results of the total samples when dissolved concentrations are greater than the CRDL and the total concentration. Results of both dissolved and total samples are qualified as estimates and flagged "J" when the dissolved analyte is greater than the respective total concentration analyte by more than 10%. Results of both dissolved and total samples are rejected and flagged "R" when the dissolved analyte is greater than its total concentration by more than 50%.

Since Westinghouse Validation Guidelines do not address this issue, the guidelines outlined in the Standard Operation Procedure for Evaluation of Metals Data for the Contract Laboratory Program, Region II were followed.

Below is a table of the total and dissolved samples which were validated and compared using the method described above.

Total	Dissolved
B088P6	B088P7
B088Q5	B088Q6
B088V5	B088V6
B088Y0	B088Y1
B08910	B08911
B088Z5	B088Z6
B08920	B08921

The filtered results exceeded the total results by more than 10% and the associated samples were qualified as estimates and flagged "J" for lead in the following samples:

- Sample numbers B088Z5 and B088Z6, and B08920 and B08921.

All other total versus filtered RPD results met the QC requirements.

5.7 FURNACE AA QUALITY CONTROL

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

5.7.1 Duplicate Injections

Each furnace analysis requires a minimum of two injections (burns), except for full Method of Standard Addition (MSA). For concentrations greater than CRDL, the duplicate injection readings must agree within 50% relative standard deviation (RSD) or coefficient of variation (CV). If these requirements are not met, the analytical sample must be rerun once (i.e., two additional burns). If the readings are then still outside the QC limits, the result is qualified as an estimate and flagged "J".

All duplicate injection quality control requirements were met.

5.7.5 Analytical Spike Recoveries

For all samples whose analytical spike results are outside the 85 to 115 percent control limit, but whose absorbances are less than 50 percent of the analytical spike absorbance, the samples were flagged as estimates "J". In cases where the analytical spike recovery was 0.0 percent, the results were rejected and flagged "R".

The analytical spike recovery fell outside the established QC limits and the associated results flagged "J" for arsenic in the following samples:

- Sample numbers B088Q5, B088V5 and B08910 in SDG No. B088Q5.
- Sample number B088Z5 in SDG No. B088Z5.

The analytical spike recovery fell outside the established QC limits and the associated results flagged "J" for lead in the following samples:

- Sample numbers B088Q6 and B088Y1 in SDG No. B088Q6.
- All samples in SDG No. B088Z5.
- Sample number B088Z6 in SDG No. B088Z6.

The analytical spike recovery fell outside the established QC limits and the associated results flagged "J" for selenium in the following samples:

- All samples in SDG No. B088P6.
- All samples in SDG No. B088Q5.
- Sample numbers B088Q6, B088V6 and B08911 in SDG No. B088Q6.
- Sample number B088Z5 in SDG No. B088Z5.

The analytical spike recovery fell outside the established QC limits and the associated results flagged "J" for thallium in the following samples:

- Sample number B088Y0 in SDG No. B088Q5.
- Sample numbers B088Q6 and B088Y1 in SDG No. B088Q6.
- All samples in SDG No. B088Z5.
- Sample number B088Z6 in SDG No. B088Z6.

All other analytical spike recovery results were acceptable.

5.8 ANALYTE QUANTITATION AND DETECTION LIMITS

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

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

5.9 OVERALL ASSESSMENT AND SUMMARY

All samples were analyzed and reported under the 1990 CLP protocol (EPA 1990). Several inconsistencies and deviations from the protocol were observed. They are as follows:

A CCV and CCB must be analyzed immediately after the ICV and ICB. ICAP and Mercury do not follow this protocol. For ICAP analysis a CCV and CCB were run after the initial interference checks and CRI. This is incorrect because the ICSA/AB and CRII are considered analytical samples and according to the CLP protocol a CCV and CCB must be run prior to any analytical samples. For mercury, the CCV and CCB were analyzed for after the first ten samples. Refer to Sections E-11 paragraph 5b and E-15 paragraph 4a of the EPA CLP SOW 3/90 protocol.

Internal Chains of Custody lacked sufficient information such as interdepartmental transfers, i.e., from the sample custodian to the technician responsible for sample preparation and the dates these transfers took place plus the EPA sample ID number. Without this information Internal Chains of Custody can not be verified as those belonging to samples in this report. Refer to Sections F-5, paragraph 1.5 and F-3, paragraph 1.4 of the EPA CLP SOW 3/90 protocol.

For samples analyzed by Roy F. Weston, incorrect ICP instrument detection limits (IDL's) are being used to report results down to the IDL. Two sets of IDL's (Form 10) are included in the data package for ICAP analysis, one for instrument IC1 and one for instrument IC3. According to the case narrative addendum, Roy F. Weston states that the highest IDL of the two instruments is used as per Exhibit E, Section V, Item 10 (pg. E-53) of the EPA Statement of Work for Inorganics Analysis, Document Number ILM05.0. This is correct only when two instruments are being used to determine sample results within a data package. However, in this data package Roy F. Weston used only one ICP instrument to determine the sample results and therefore it is that instrument's IDL's which should be used to calculate results. According to Form XIV information IC1 is the instrument being used for analysis while the IDL's of IC3 are the ones reported on Forms 1-9. This can effect results flagged "U" or results which may be flagged "U" because of laboratory blank contamination.

All raw data associated with Roy F. Weston has not been labelled with the client (EPA) ID number. Results labelled with only the laboratory sample ID number is insufficient. Refer to Section B-10 of the EPA CLP SOW 390.

Except as noted in the preceding sections, all other data are usable for all purposes.

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B088P6																				
Sample Number		B088P6		B088P7																	
Location		199-F5-45		199-F5-45																	
Remarks		Split		Split, FIL																	
Sample Date		3/31/93		3/31/93																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	59.0	U	59.0	U																
Antimony	60	40.0	U	40.0	U																
Arsenic	10	5.6	UJ	3.7	UJ																
Barium	200	25.8		24.5																	
Beryllium	5	1.0	U	1.0	U																
Cadmium	5	5.0	U	5.0	U																
Calcium	5000	41400		41000																	
Chromium	10	7.0		6.0	U																
Cobalt	50	6.0	U	6.0	U																
Copper	25	10.0	U	10.0	U																
Iron	100	81.0	U	38.3	U																
Lead	3	2.0	U	2.0	U																
Magnesium	5000	9700		9550																	
Manganese	15	4.1		4.1																	
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	21.0	U	21.0	U																
Potassium	5000	5160		4240																	
Selenium	5	2.0	UJ	2.0	UJ																
Silver	10	9.0	U	9.0	U																
Sodium	5000	16100		15800																	
Thallium	10	5.0	U	5.0	U																
Vanadium	50	16.8	U	9.1	U																
Zinc	20	46.6	U	85.5																	
Cyanide	10	20.0	U	N/A																	

FIL = Filtered, N/A = Not Applicable

9613401.1540

BLANK AND SAMPLE DATA SUMMARY

SDG: B088P6	REVIEWER: DKW			DATE: 7/20/93				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB3	Arsenic	2.2			ug/L	11.0	22.0	All	U
PBW	Iron	85.4			ug/L	427	854	All	U
CCB3	Vanadium	24.6			ug/L	123	246	All	U
PBW	Zinc	12.1			ug/L	60.5	121	B088P6	U

DATA QUALIFICATION SUMMARY

SDG: B088P6	REVIEWER: DKW	DATE: 7/20/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Arsenic	U	All	Lab blank contamination
Iron	U	All	Lab blank contamination
Vanadium	U	All	Lab blank contamination
Zinc	U	All	Lab blank contamination
Arsenic	J	All	Matrix spike recovery
Selenium	J	All	GFAA analytical spike

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q0																				
Sample Number		B088Q0		B088W0		B088X0		B08900													
Location		199-F1-2		199-F5-46		199-F5-48		199-F8-3													
Remarks		NV		NV		NV		NV													
Sample Date		4/02/93		4/03/93		4/03/93		4/03/93													
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	56.5		26.4		33.5		63.2													
Antimony	60	17.9	U	17.9	U	17.9	U	17.9	U												
Arsenic	10	9.4		2.5	U	2.5	U	2.5	U												
Barium	200	30.3		41.7		41.7		126													
Beryllium	5	0.50	U	0.50	U	0.50	U	0.50	U												
Cadmium	5	1.7	U	1.7	U	1.7	U	1.7	U												
Calcium	5000	33300		79900		85200		134000													
Chromium	10	9.3		109		29.4		25.4													
Cobalt	50	3.8	U	3.8	U	3.8	U	3.8	U												
Copper	25	4.2	U	4.2	U	4.2	U	5.2													
Iron	100	141		83.2		45.2		138													
Lead	3	1.3	U	1.3	U	1.5		2.2													
Magnesium	5000	11000		10600		20200		34500													
Manganese	15	3.8		2.2		2.2		6.0													
Mercury	0.2	0.10	U	0.10	U	0.10	U	0.10	U												
Nickel	40	6.1	U	6.1	U	6.1	U	7.0													
Potassium	5000	4010		4410		6290		7280													
Selenium	5	3.3	U	3.3	U	3.3	U	3.3	U												
Silver	10	3.8	U	3.8	U	3.8	U	3.8	U												
Sodium	5000	47500		20500		23200		59700													
Thallium	10	1.2	U	1.2	U	1.2	U	1.2	U												
Vanadium	50	19.5		5.3		4.4		8.0													
Zinc	20	16.6		18.1		17.3		18.1													
Cyanide	10	10.0	U	10.0	U	10.0	U	10.0	U												

NV = Not Validated

9613401.1543

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q1																				
Sample Number		B088Q1		B088W1		B088X1		B08901													
Location		199-F1-2		199-F5-46		199-F5-48		199-F8-3													
Remarks		FIL, NV		FIL, NV		FIL, NV		FIL, NV													
Sample Date		4/02/93		4/03/93		4/03/93		4/03/93													
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	31.1		19.2	U	39.8		30.3													
Antimony	60	18.6	U	18.6	U	18.6	U	18.6	U												
Arsenic	10	10.8		2.5	U	2.8		4.2													
Barium	200	30.4		43.6		42.8		127													
Beryllium	5	0.30	U	0.30	U	0.30	U	0.30	U												
Cadmium	5	1.4	U	1.4	U	1.4	U	1.4	U												
Calcium	5000	34800		83300		90100		142000													
Chromium	10	3.3	U	104		23.4		16.4													
Cobalt	50	2.9	U	2.9	U	2.9	U	2.9	U												
Copper	25	7.0		7.0		5.9		6.7													
Iron	100	23.2		19.4		16.9		20.3													
Lead	3	2.1		1.3	U	1.3	U	1.3	U												
Magnesium	5000	11400		10900		21000		36300													
Manganese	15	1.4		1.7		1.4		3.8													
Mercury	0.2	0.10	U	0.10	U	0.10	U	0.10	U												
Nickel	40	4.2	U	4.2	U	4.2	U	4.2	U												
Potassium	5000	4240		4630		6520		7730													
Selenium	5	3.3	U	16.5	U	3.7		3.3	U												
Silver	10	3.3	U	3.3	U	3.3	U	3.3	U												
Sodium	5000	48600		21000		23800		62000													
Thallium	10	1.2	U	1.2	U	1.2	U	1.2	U												
Vanadium	50	22.9		4.4		7.1		8.0													
Zinc	20	9.7		7.1		4.8	U	25.9													
Cyanide	10	N/A		N/A		N/A		N/A													

FIL = Filtered, NV = Not Validated, N/A = Not Applicable

9613401.1644
WHC-SD-EN-TI-187, Rev. 0

INORGANIC ANALYSIS, WATER MATRIX, (μg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q5																				
Sample Number		B088Q5		B088V5		B088Y0		B08910													
Location		199-F5-1		199-F5-45		199-F7-1		199-F5-45													
Remarks								DUP													
Sample Date		3/31/93		3/31/93		3/31/93		3/31/93													
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	36.2	U	37.5	U	35.2	U	34.7	U												
Antimony	60	18.4	U	18.4	U	18.4	U	18.4	U												
Arsenic	10	2.3	UJ	4.4	J	21.6	J	5.6	J												
Barium	200	43.9		23.3		43.0		25.2													
Beryllium	5	0.50	U	0.50	U	0.50	U	0.50	U												
Cadmium	5	1.6	U	1.6	U	1.6	U	1.6	U												
Calcium	5000	40500		40800		59100		40600													
Chromium	10	2.7	U	2.7	U	3.7		4.7													
Cobalt	50	2.5	U	2.5	U	2.5	U	2.5	U												
Copper	25	4.6	U	2.9	U	2.9	U	10.4	U												
Iron	100	93.5		27.7	U	31.5	U	46.6	U												
Lead	3	1.7		11.8		1.5		2.3													
Magnesium	5000	6050		9570		18400		9550													
Manganese	15	2.3	U	2.2	U	1.2	U	2.6	U												
Mercury	0.2	0.10	U	0.10	U	0.10	U	0.10	U												
Nickel	40	3.0	U	3.0	U	3.0	U	3.0	U												
Potassium	5000	2460		4290		7250		4330													
Selenium	5	3.3	UJ	3.3	UJ	3.3	UJ	3.3	UJ												
Silver	10	3.9	U	3.9	U	3.9	U	3.9	U												
Sodium	5000	4060		16000		55600		15900													
Thallium	10	1.2	U	1.2	U	1.2	UJ	1.2	U												
Vanadium	50	2.5	U	9.4	U	14.8		11.3	U												
Zinc	20	4.7	U	4.7	U	5.1		6.1													
Cyanide	10	10.0	U	10.0	U	10.0	U	10.0	U												

DUP = Duplicate

9613401.1545
WHC-SD-EN-TI-187, Rev. 0

BLANK AND SAMPLE DATA SUMMARY

SDG: B088Q5	REVIEWER: DKW			DATE: 7/26/93				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCB3	Aluminum	48.8			ug/L	244	488	All	U
PBW	Copper	18.4			ug/L	92	184	B088Q5, B08910	U
CCB1	Iron	11.1			ug/L	55.5	111	B088V5, B088Y0, B08910	U
CCB1	Manganese	1.4			ug/L	7.0	14.0	All	U
CCB1	Vanadium	2.5			ug/L	12.5	25.0	B088V5, B08910	U

9613401.1546

ACCURACY DATA SUMMARY

SDG: B088Q5	REVIEWER: DKW	DATE: 7/26/93	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B088Y0S	Arsenic	68.0	All	J
B088Y0S	Selenium	69.1	All	J
B088Q5A	Arsenic	58.2	B088Q5	J
B088V5A	Arsenic	66.2	B088V5	J
B08910A	Arsenic	59.4	B08910	J
B088Q5A	Selenium	42.5	B088Q5	J
B088V5A	Selenium	49.5	B088V5	J
B088Y0A	Selenium	59.8	B088Y0	J
B08910A	Selenium	65.1	B08910	J
B088Y0A	Thallium	82.3	B088Y0	J

DATA QUALIFICATION SUMMARY

SDG: B088Q5	REVIEWER: DKW	DATE: 7/26/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	All	Lab blank contamination
Copper	U	B088Q5, B08910	Lab blank contamination
Iron	U	B088V5, B088Y0, B08910	Lab blank contamination
Manganese	U	All	Lab blank contamination
Vanadium	U	B088V5, B08910	Lab blank contamination
Arsenic	J	All	Matrix spike recovery
Selenium	J	All	Matrix spike recovery
Arsenic	J	B088Q5, B088V5, B08910	GFAA analytical spike recovery
Selenium	J	All	GFAA analytical spike recovery
Thallium	J	B088Y0	GFAA analytical spike recovery

9613401.1640

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q6																				
Sample Number		B088Q6		B088V6		B088Y1		B08911													
Location		199-F5-1		199-F5-45		199-F7-1		199-F5-45													
Remarks		FIL		FIL		FIL		DUP, FIL													
Sample Date		3/31/93		3/31/93		3/31/93		3/31/93													
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	23.5	U	23.5	U	23.5	U	24.0	U												
Antimony	60	17.9	U	17.9	U	17.9	U	17.9	U												
Arsenic	10	3.5	U	3.7		10.4		4.4													
Barium	200	45.2		26.4		41.4		23.9													
Beryllium	5	0.50	U	0.50	U	0.50	U	0.50	U												
Cadmium	5	1.7	U	1.7	U	1.7	U	1.7	U												
Calcium	5000	39200		40300		57800		41400													
Chromium	10	5.8	U	5.8	U	5.8	U	5.8	U												
Cobalt	50	3.8	U	3.8	U	3.8	U	3.8	U												
Copper	25	4.2	U	4.2	U	4.2	U	4.2	U												
Iron	100	7.4	U	4.8	U	4.8	U	7.8	U												
Lead	3	1.7	J	1.3	U	2.5	J	1.3	U												
Magnesium	5000	5890		9520		18200		9820													
Manganese	15	1.8	U	1.8	U	1.8	U	1.8	U												
Mercury	0.2	0.10	U	0.10	U	0.10	U	0.10	U												
Nickel	40	6.1	U	6.1	U	6.1	U	6.1	U												
Potassium	5000	2150		4110		6980		4330													
Selenium	5	2.9	UJ	2.9	UJ	14.5	UJ	2.9	UJ												
Silver	10	3.8	U	3.8	U	3.8	U	3.8	U												
Sodium	5000	3950		15900		55600		16400													
Thallium	10	1.2	UJ	1.2	U	1.2	UJ	1.2	U												
Vanadium	50	3.3	U	11.6		16.8		11.5													
Zinc	20	17.0	U	3.4	U	14.0	U	9.1	U												
Cyanide	10	N/A		N/A		N/A		N/A													

FIL = Filtered, DUP = Duplicate, N/A = Not Applicable

BLANK AND SAMPLE DATA SUMMARY

SDG: B088Q6	REVIEWER: KG			DATE: 7/26/93				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCV	Aluminum	35.7			ug/L	178	357	B08911	U
CCV	Iron	-12.0			ug/L	-60.0	-120	B088Q6, B08911	U
CCV	Zinc	17.5			ug/L	87.5	175	B088Q6, B088Y1, B08911	U

ACCURACY DATA SUMMARY

SDG: B088Q6	REVIEWER: KG	DATE: 7/26/93	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B088Q6A	Lead	79.4	B088Q6	J
B088Y1A	Lead	78.3	B088Y1	J
B088Q6A	Selenium	78.5	B088Q6	J
B088V6A	Selenium	65.2	B088V6	J
B08911A	Selenium	79.5	B08911	J
B088Q6A	Thallium	83.1	B088Q6	J
B088Y1A	Thallium	78.7	B088Y1	J

PRECISION DATA SUMMARY

SDG: B088Q6	REVIEWER: KG	DATE: 7/26/93	PAGE 1 OF 1
COMMENTS:			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Selenium	B088Y1	B088Y1D	200	All	J

9613401.1552

DATA QUALIFICATION SUMMARY

SDG: B088Q6	REVIEWER: KG	DATE: 7/26/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B08911	Lab blank contamination
Iron	U	B088Q6, B08911	Lab blank contamination
Zinc	U	B088Q6, B088Y1, B08911	Lab blank contamination
Lead	J	B088Q6, B088Y1	GFAA analytical spike recovery
Selenium	J	B088Q6, B088V6, B0891	GFAA analytical spike recovery
Thallium	J	B088Q6, B088Y1	GFAA analytical spike recovery
Selenium	J	All	Duplicate RPD results

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088RO																				
Sample Number		B088R0		B088S5		B088W5		B08915													
Location		199-F5-3		199-F5-6		199-F5-47		199-F5-47													
Remarks		NV		NV		NV		DUP, NV													
Sample Date		4/07/93		4/07/93		4/07/93		4/07/93													
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	41.3		57.7		24.4		19.2	U												
Antimony	60	18.6	U	18.6	U	18.6	U	18.6	U												
Arsenic	10	2.3	U	2.3	U	3.6		2.6													
Barium	200	15.9		19.1		58.4		58.4													
Beryllium	5	0.30	U	0.30	U	0.30	U	0.30	U												
Cadmium	5	1.4	U	1.4	U	1.4	U	1.4	U												
Calcium	5000	46300		22300		104000		105000													
Chromium	10	30.6		6.3		20.4		20.7													
Cobalt	50	2.9	U	2.9	U	2.9	U	2.9	U												
Copper	25	2.7	U	14.7		2.7	U	2.7	U												
Iron	100	11200		14400		48.7		112													
Lead	3	3.2		3.4		2.2		2.3													
Magnesium	5000	11400		6480		23600		23800													
Manganese	15	96.0		42.6		23.9		28.0													
Mercury	0.2	0.10	U	0.10	U	0.10	U	0.10	U												
Nickel	40	36.3		4.2	U	5.4		4.2	U												
Potassium	5000	4700		4630		6150		6100													
Selenium	5	3.3	U	3.3	U	5.2		3.3	U												
Silver	10	3.3	U	3.3	U	3.3	U	3.3	U												
Sodium	5000	6810		23700		34500		34000													
Thallium	10	2.7	U	2.7	U	2.7	U	2.7	U												
Vanadium	50	2.1	U	2.1	U	3.7		4.0													
Zinc	20	4.8	U	33.4		4.8	U	4.8	U												
Cyanide	10	10.0	U	10.0	U	10.0	U	10.0	U												

DUP = Duplicate, NV = Not Validated

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INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R1																				
Sample Number		B088R1		B088S6		B088W6		B08916													
Location		199-F5-3		199-F5-6		199-F5-47		199-F5-47													
Remarks		FIL, NV		FIL, NV		FIL, NV		DUP, FIL, NV													
Sample Date		4/07/93		4/07/93		4/07/93		4/07/93													
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	23.5	U	23.5	U	23.5	U	28.8													
Antimony	60	17.9	U	17.9	U	17.9	U	17.9	U												
Arsenic	10	3.5	U	3.5	U	3.5	U	3.5	U												
Barium	200	12.0		8.0		64.1		64.1													
Beryllium	5	0.50	U	0.50	U	0.50	U	0.50	U												
Cadmium	5	1.7	U	1.7	U	1.7	U	1.7	U												
Calcium	5000	45600		23200		103000		104000													
Chromium	10	5.8	U	5.8	U	20.7		17.9													
Cobalt	50	3.8	U	3.8	U	3.8	U	3.8	U												
Copper	25	4.2	U	4.2	U	4.2	U	4.2	U												
Iron	100	66.5		10.5		23.0		14.5													
Lead	3	1.2	U	1.6		1.2		5.7													
Magnesium	5000	11500		6590		23600		23800													
Manganese	15	28.0		8.3		24.8		25.0													
Mercury	0.2	0.10	U	0.10	U	0.10	U	0.10	U												
Nickel	40	6.1	U	6.1	U	6.1	U	6.1	U												
Potassium	5000	4850		4690		6160		6240													
Selenium	5	5.3		2.9	U	2.9	U	4.4													
Silver	10	3.8	U	3.8	U	3.8	U	3.8	U												
Sodium	5000	6980		23400		33400		33800													
Thallium	10	2.6	U	2.6	U	2.6	U	2.6	U												
Vanadium	50	3.3	U	3.3	U	5.5		5.0													
Zinc	20	3.6		3.4	U	3.4	U	3.4	U												
Cyanide	10	N/A		N/A		N/A		N/A													

DUP = Duplicate, FIL = Filtered, NV = Not Validated, N/A = Not Applicable

9613401.1555

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R5																				
Sample Number		B088R5		B088T0																	
Location		199-F5-4		199-F5-42																	
Remarks		NV		NV																	
Sample Date		4/05/93		4/05/93																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	19.2	U	19.2	U																
Antimony	60	18.6	U	18.6	U																
Arsenic	10	5.2		3.5	U																
Barium	200	52.3		34.0																	
Beryllium	5	0.30	U	0.30	U																
Cadmium	5	1.4	U	1.4	U																
Calcium	5000	102000		26700																	
Chromium	10	19.7		7.1																	
Cobalt	50	2.9	U	2.9	U																
Copper	25	4.1		2.7	U																
Iron	100	101		58.8																	
Lead	3	2.1		1.4																	
Magnesium	5000	23700		4660																	
Manganese	15	1.0	U	2.8																	
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	4.2	U	4.2	U																
Potassium	5000	6390		1930																	
Selenium	5	8.5		2.9	U																
Silver	10	3.3	U	3.3	U																
Sodium	5000	26500		2810																	
Thallium	10	1.2	U	1.2	U																
Vanadium	50	6.0		2.1	U																
Zinc	20	4.8	U	10.3																	
Cyanide	10	10.0	U	10.0	U																

NV = Not Validated

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INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																						
Laboratory: TMA																						
Case	SDG: B088R6																					
Sample Number		B088R6		B088T1																		
Location		199-F5-4		199-F5-42																		
Remarks		FIL, NV		FIL, NV																		
Sample Date		4/05/93		4/05/93																		
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	19.2	U	19.2	U																
Antimony	60	18.6	U	18.6	U																
Arsenic	10	1.6		1.5	U																
Barium	200	54.2		32.3																	
Beryllium	5	0.30	U	0.30	U																
Cadmium	5	1.4	U	1.4	U																
Calcium	5000	104000		26900																	
Chromium	10	18.6		4.0																	
Cobalt	50	2.9	U	2.9	U																
Copper	25	2.7	U	2.7	U																
Iron	100	8.4	U	10.3																	
Lead	3	4.6		1.8																	
Magnesium	5000	24200		4790																	
Manganese	15	1.0	U	1.8																	
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	4.2	U	4.2	U																
Potassium	5000	6750		2030																	
Selenium	5	17.5	U	17.5	U																
Silver	10	3.3	U	3.3	U																
Sodium	5000	27100		2850																	
Thallium	10	1.2	U	1.2	U																
Vanadium	50	5.4		2.1	U																
Zinc	20	4.8	U	4.8	U																
Cyanide	10	N/A		N/A																	

NV = Not Validated, FIL = Filtered, N/A = Not Applicable

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088T5																				
Sample Number		B088T5		B088X5																	
Location		199-F5-43A		199-F6-1																	
Remarks		NV		NV																	
Sample Date		4/06/93		4/06/93																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	28.0		30.3																	
Antimony	60	18.6	U	18.6	U																
Arsenic	10	2.2		1.8																	
Barium	200	26.7		31.0																	
Beryllium	5	0.30	U	0.30	U																
Cadmium	5	1.4	U	1.4	U																
Calcium	5000	29600		28400																	
Chromium	10	7.6		9.4																	
Cobalt	50	2.9	U	2.9	U																
Copper	25	5.2		3.8																	
Iron	100	29.0		47.9																	
Lead	3	2.5		2.4																	
Magnesium	5000	3890		4040																	
Manganese	15	1.8		2.0																	
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	4.2	U	4.2	U																
Potassium	5000	2660		1630																	
Selenium	5	3.5	U	3.5	U																
Silver	10	3.3	U	3.3	U																
Sodium	5000	3550		2980																	
Thallium	10	2.7	U	2.7	U																
Vanadium	50	2.1	U	2.1	U																
Zinc	20	4.8	U	4.8	U																
Cyanide	10	10.0	U	10.0	U																

NV = Not Validated

9613401.1668
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INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088T6																				
Sample Number		B088T6		B088X6																	
Location		199-F5-43A		199-F6-1																	
Remarks		FIL, NV		FIL, NV																	
Sample Date		4/06/93		4/06/93																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	23.5	U	23.5	U																
Antimony	60	17.9	U	17.9	U																
Arsenic	10	2.5		2.0																	
Barium	200	31.2		28.6																	
Beryllium	5	0.50	U	0.50	U																
Cadmium	5	1.7	U	1.7	U																
Calcium	5000	27300		29600																	
Chromium	10	5.8	U	6.3																	
Cobalt	50	3.8	U	3.8	U																
Copper	25	4.2	U	4.2	U																
Iron	100	17.2		24.7																	
Lead	3	1.3		1.2	U																
Magnesium	5000	3910		3900																	
Manganese	15	1.8	U	1.8	U																
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	6.1	U	6.1	U																
Potassium	5000	1500		2700																	
Selenium	5	3.5	U	3.5	U																
Silver	10	3.8	U	3.8	U																
Sodium	5000	2920		3610																	
Thallium	10	2.6	U	2.6	U																
Vanadium	50	3.3	U	3.3	U																
Zinc	20	3.4	U	3.4	U																
Cyanide	10	N/A		N/A																	

NV = Not Validated, FIL = Filtered, N/A = Not Applicable

9613401.1658
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INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

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Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088V0																				
Sample Number		B088V0																			
Location		199-F5-44																			
Remarks		NV																			
Sample Date		4/01/93																			
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	80.6																			
Antimony	60	17.9	U																		
Arsenic	10	2.1																			
Barium	200	37.4																			
Beryllium	5	0.50	U																		
Cadmium	5	1.7	U																		
Calcium	5000	38900																			
Chromium	10	32.7																			
Cobalt	50	3.8	U																		
Copper	25	4.2	U																		
Iron	100	129																			
Lead	3	1.6																			
Magnesium	5000	6630																			
Manganese	15	3.3																			
Mercury	0.2	0.10	U																		
Nickel	40	7.0																			
Potassium	5000	2060																			
Selenium	5	3.5	U																		
Silver	10	3.8	U																		
Sodium	5000	5610																			
Thallium	10	2.7	U																		
Vanadium	50	3.3	U																		
Zinc	20	7.6																			
Cyanide	10	10.0	U																		

NV = Not Validated

9613401.1560

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																						
Laboratory: TMA																						
Case	SDG: B088V1																					
Sample Number		B088V1																				
Location		199-F5-44																				
Remarks		FIL, NV																				
Sample Date		4/01/93																				
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	23.5	U																			
Antimony	60	17.9	U																			
Arsenic	10	2.3	U																			
Barium	200	38.7																				
Beryllium	5	0.50	U																			
Cadmium	5	1.7	U																			
Calcium	5000	40400																				
Chromium	10	25.9																				
Cobalt	50	3.8	U																			
Copper	25	4.2	U																			
Iron	100	14.0																				
Lead	3	1.8																				
Magnesium	5000	6840																				
Manganese	15	1.8	U																			
Mercury	0.2	0.10	U																			
Nickel	40	6.1	U																			
Potassium	5000	2050																				
Selenium	5	3.3	U																			
Silver	10	3.8	U																			
Sodium	5000	5770																				
Thallium	10	2.7	U																			
Vanadium	50	3.3	U																			
Zinc	20	3.4	U																			
Cyanide	10	N/A																				

FIL = Filtered, NV = Not Validated, N/A = Not Applicable

9613401.1561

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Y5																				
Sample Number		B088Y5		B08905																	
Location		199-F7-2		199-F8-4																	
Remarks		NV		NV																	
Sample Date		4/08/93		4/08/93																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	41.9		145																	
Antimony	60	17.9	U	17.9	U																
Arsenic	10	5.3		3.5																	
Barium	200	25.2		39.8																	
Beryllium	5	0.50	U	0.50	U																
Cadmium	5	1.7	U	1.7	U																
Calcium	5000	58400		66500																	
Chromium	10	5.8	U	17.6																	
Cobalt	50	3.8	U	3.8	U																
Copper	25	4.2	U	4.2	U																
Iron	100	40.6		261																	
Lead	3	3.2		2.0																	
Magnesium	5000	17500		16900																	
Manganese	15	1.8	U	13.0																	
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	6.1	U	6.1	U																
Potassium	5000	6430		5640																	
Selenium	5	3.3	U	3.3	U																
Silver	10	3.8	U	3.8	U																
Sodium	5000	53200		48400																	
Thallium	10	1.2	U	1.2	U																
Vanadium	50	15.4		11.1																	
Zinc	20	9.2		12.1																	
Cyanide	10	10.0	U	10.0	U																

NV = Not Validated

9613401.1562

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Y6																				
Sample Number		B088Y6		B08906																	
Location		199-F7-2		199-F8-4																	
Remarks		FIL, NV		FIL, NV																	
Sample Date		4/08/93		4/08/93																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	45.3		23.5	U																
Antimony	60	17.9	U	17.9	U																
Arsenic	10	7.7		5.5																	
Barium	200	24.4		40.6																	
Beryllium	5	0.50	U	0.50	U																
Cadmium	5	1.7	U	1.7	U																
Calcium	5000	58200		64700																	
Chromium	10	5.8	U	11.9																	
Cobalt	50	3.8	U	3.8	U																
Copper	25	4.2	U	4.2	U																
Iron	100	15.6		26.2																	
Lead	3	3.9		3.9																	
Magnesium	5000	17500		16300																	
Manganese	15	1.8	U	1.8	U																
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	6.1	U	6.1	U																
Potassium	5000	6410		5490																	
Selenium	5	3.5		3.3	U																
Silver	10	3.8	U	3.8	U																
Sodium	5000	52900		47200																	
Thallium	10	1.2	U	1.2	U																
Vanadium	50	15.1		9.0																	
Zinc	20	3.4	U	3.4	U																
Cyanide	10	N/A		N/A																	

FIL = Filtered, NV = Not Validated, N/A = Not Applicable

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INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z0																				
Sample Number		B088Z0																			
Location		199-F7-3																			
Remarks		NV																			
Sample Date		4/09/93																			
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	35.8																			
Antimony	60	18.6	U																		
Arsenic	10	5.4																			
Barium	200	51.5																			
Beryllium	5	0.30	U																		
Cadmium	5	1.4	U																		
Calcium	5000	68900																			
Chromium	10	5.6																			
Cobalt	50	2.9	U																		
Copper	25	2.8																			
Iron	100	70.5																			
Lead	3	2.5																			
Magnesium	5000	21200																			
Manganese	15	64.0																			
Mercury	0.2	0.10	U																		
Nickel	40	6.4																			
Potassium	5000	7860																			
Selenium	5	9.0																			
Silver	10	3.3	U																		
Sodium	5000	74100																			
Thallium	10	2.6	U																		
Vanadium	50	7.1																			
Zinc	20	10.9																			
Cyanide	10	10.0	U																		

NV = Not Validated

9613401.1564
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INORGANIC ANALYSIS, WATER MATRIX, (μg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z1																				
Sample Number		B088Z1																			
Location		199-F7-3																			
Remarks		FIL, NV																			
Sample Date		4/09/93																			
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	25.9																			
Antimony	60	18.6	U																		
Arsenic	10	5.2																			
Barium	200	53.8																			
Beryllium	5	0.30	U																		
Cadmium	5	1.4	U																		
Calcium	5000	71800																			
Chromium	10	3.3	U																		
Cobalt	50	2.9	U																		
Copper	25	2.7	U																		
Iron	100	28.2																			
Lead	3	3.7																			
Magnesium	5000	22000																			
Manganese	15	63.8																			
Mercury	0.2	0.10	U																		
Nickel	40	4.9																			
Potassium	5000	8120																			
Selenium	5	5.2																			
Silver	10	3.3	U																		
Sodium	5000	76700																			
Thallium	10	1.2	U																		
Vanadium	50	7.1																			
Zinc	20	4.8	U																		
Cyanide	10	N/A																			

NV = Not Validated, FIL = Filtered, N/A = Not Applicable

9613401.1565
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INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z5																				
Sample Number		B088Z5		B08920																	
Location		199-F8-2		EB 1																	
Remarks				EB																	
Sample Date		4/12/93		4/12/93																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	36.8	U	23.5	U																
Antimony	60	17.9	U	17.9	U																
Arsenic	10	4.3	J	3.5	U																
Barium	200	45.0		2.5	U																
Beryllium	5	0.83		0.50	U																
Cadmium	5	1.7	U	1.7	U																
Calcium	5000	94300		42.3	U																
Chromium	10	5.8	U	5.8	U																
Cobalt	50	3.8	U	3.8	U																
Copper	25	4.2	U	4.2	U																
Iron	100	13.7	U	10.9	U																
Lead	3	2.8	J	2.6	J																
Magnesium	5000	24600		46.4	U																
Manganese	15	1.8	U	1.8	U																
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	6.1	U	6.1	U																
Potassium	5000	7770		188	U																
Selenium	5	4.5	J	2.9	U																
Silver	10	3.8	U	3.8	U																
Sodium	5000	32000		193																	
Thallium	10	2.6	UJ	2.6	UJ																
Vanadium	50	8.0		3.3	U																
Zinc	20	3.4	U	3.4	U																
Cyanide	10	10.0	U	10.0	U																

EB = Equipment Blank

9613401.1566
WHC-SD-EN-TI-187, Rev. 0

BLANK AND SAMPLE DATA SUMMARY

SDG: B088Z5	REVIEWER: KG			DATE: 7/19/93				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
CCV	Aluminum	24.6			ug/L	123	246	B088Z5	U
ICV	Iron	-19.8			ug/L	-99	-198	B088Z5, B08920	U

9613401.1567

ACCURACY DATA SUMMARY

SDG: B088Z5	REVIEWER: KG	DATE: 7/19/93	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B088Z5A	Arsenic	83.3	B088Z5	J
B088Z5A	Lead	75.8	B088Z5	J
B08920A	Lead	82.9	B08920	J
B088Z5A	Selenium	46.8	B088Z5	J
B088Z5A	Thallium	53.3	B088Z5	J
B08920A	Thallium	81.9	B08920	J

9613401.1568

PRECISION DATA SUMMARY

SDG: B088Z5	REVIEWER: KG	DATE: 7/19/93	PAGE 1 OF 1
COMMENTS:			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Lead	B088Z5	B088Z6	32.8	B088Z5	J
Lead	B08920	B08921	26.7	B08920	J

9613401.1569

DATA QUALIFICATION SUMMARY

SDG: B088Z5	REVIEWER: KG	DATE: 7/19/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B088Z5	Lab Blank Contamination
Iron	U	B088Z5, B08920	Lab Blank Contamination
Lead	J	B088Z5	GFAA Analytical Spike
Lead	J	B08920	GFAA Analytical Spike
Thallium	J	B088Z5	GFAA Analytical Spike
Thallium	J	B08920	GFAA Analytical Spike
Arsenic	J	B088Z5	GFAA Analytical Spike
Selenium	J	B088Z5	GFAA Analytical Spike
Selenium	J	B088Z5	MSA corr <0.995
Lead	J	B088Z5, B08920	Total vs. Dissolved

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z6																				
Sample Number		B088Z6		B08921																	
Location		199-F8-2		EB 1																	
Remarks		FIL		FIL, EB																	
Sample Date		4/12/93		4/12/93																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	23.5	U	29.5	U																
Antimony	60	17.9	U	19.1																	
Arsenic	10	3.5	U	3.5	U																
Barium	200	44.9		2.5	U																
Beryllium	5	0.50	U	0.50	U																
Cadmium	5	1.7	U	1.7	U																
Calcium	5000	94900		42.3	U																
Chromium	10	7.0		5.8	U																
Cobalt	50	3.8	U	3.8	U																
Copper	25	4.2	U	4.2	U																
Iron	100	4.8	U	4.8	U																
Lead	3	3.9	J	3.4	J																
Magnesium	5000	24800		46.4	U																
Manganese	15	1.8	U	1.8	U																
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	6.1	U	6.1	U																
Potassium	5000	7920		188	U																
Selenium	5	3.6	J	2.9	U																
Silver	10	3.8	U	3.8	U																
Sodium	5000	32600		139	U																
Thallium	10	1.2	UJ	1.2	U																
Vanadium	50	6.4		3.3	U																
Zinc	20	3.4	U	3.4	U																
Cyanide	10	N/A		N/A																	

EB = Equipment Blank, FIL = Filtered, N/A = Not Applicable

9613401.1571

BLANK AND SAMPLE DATA SUMMARY

SDG: B088Z6	REVIEWER: KG			DATE: 7/16/93				PAGE 1 OF 1	
COMMENTS:									
SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
PB	Aluminum	58.46			ug/L	292	585	B08921	U
PB	Sodium	78.31			ug/L	39.2	783	B08921	U

9613401.1572

ACCURACY DATA SUMMARY

SDG: B088Z6	REVIEWER: KG	DATE: 7/16/93	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B088Z6A	Lead	77.8	B088Z6	J
B088Z6A	Thallium	81.2	B088Z6	J

PRECISION DATA SUMMARY

SDG: B088Z6	REVIEWER: KG	DATE: 7/19/93	PAGE 1 OF 1
COMMENTS:			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
Lead	B088Z6	B088Z5	32.8	B088Z6	J
Lead	B08921	B08920	26.7	B08921	J

9613401.1574

DATA QUALIFICATION SUMMARY

SDG: B088Z6	REVIEWER: KG	DATE: 7/16/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Aluminum	U	B08921	Lab Blank Contamination
Sodium	U	B08921	Lab Blank Contamination
Lead	J	B088Z6	GFAA Analytical Spike
Thallium	J	B088Z6	GFAA Analytical Spike
Selenium	J	B088Z6	MSA corr. <0.995
Lead	J	B088Z6, B08921	Total vs. Dissolved

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B08925																				
Sample Number		B08925																			
Location		EB 2																			
Remarks		NV, EB																			
Sample Date		4/13/93																			
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	19.2	U																		
Antimony	60	18.6	U																		
Arsenic	10	3.5	U																		
Barium	200	2.6																			
Beryllium	5	0.30	U																		
Cadmium	5	1.4	U																		
Calcium	5000	334																			
Chromium	10	3.3	U																		
Cobalt	50	2.9	U																		
Copper	25	4.6																			
Iron	100	67.2																			
Lead	3	1.9																			
Magnesium	5000	133																			
Manganese	15	3.2																			
Mercury	0.2	0.10	U																		
Nickel	40	4.2	U																		
Potassium	5000	176																			
Selenium	5	2.9	U																		
Silver	10	3.3	U																		
Sodium	5000	383																			
Thallium	10	2.7	U																		
Vanadium	50	2.1	U																		
Zinc	20	66.5																			
Cyanide	10	10.0	U																		

EB = Equipment Blank, NV = Not Validated

9613401.1576

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																							
Laboratory: TMA																							
Case	SDG: B08926																						
Sample Number		B08926																					
Location		EB 2																					
Remarks		FIL, NV, EB																					
Sample Date		4/13/93																					
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	19.2	U																				
Antimony	60	18.6	U																				
Arsenic	10	2.3	U																				
Barium	200	1.1																					
Beryllium	5	0.30	U																				
Cadmium	5	1.4	U																				
Calcium	5000	93.7	U																				
Chromium	10	3.3	U																				
Cobalt	50	2.9	U																				
Copper	25	2.7	U																				
Iron	100	8.4	U																				
Lead	3	4.0																					
Magnesium	5000	28.5																					
Manganese	15	1.0	U																				
Mercury	0.2	0.10	U																				
Nickel	40	4.2	U																				
Potassium	5000	93.6	U																				
Selenium	5	3.3	U																				
Silver	10	3.3	U																				
Sodium	5000	90.8																					
Thallium	10	1.2	U																				
Vanadium	50	2.1	U																				
Zinc	20	4.8	U																				
Cyanide	10	N/A																					

EB = Equipment Blank, FIL = Filtered, NV = Not Validated, N/A = Not Applicable

9613401.1577
WHC-SD-EN-TI-187, Rev. 0

INORGANIC ANALYSIS, WATER MATRIX, (µg/L)

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B08930																				
Sample Number		B08930		B08931																	
Location		199-F5-47		199-F5-47																	
Remarks		Split, NV		Split, FIL, NV																	
Sample Date		4/07/93		4/07/93																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	200	59.00	U	59.00	U																
Antimony	60	40.00	U	40.00	U																
Arsenic	10	2.00	U	2.00	U																
Barium	200	56.70		58.40																	
Beryllium	5	1.00	U	1.00	U																
Cadmium	5	5.00	U	5.00	U																
Calcium	5000	111000		104000																	
Chromium	10	17.10		14.40																	
Cobalt	50	6.00	U	6.00	U																
Copper	25	10.00	U	10.00	U																
Iron	100	26.80		35.90																	
Lead	3	2.00	U	2.00	U																
Magnesium	5000	25600		23800																	
Manganese	15	31.40		23.80																	
Mercury	0.2	0.10	U	0.10	U																
Nickel	40	21.00	U	21.00	U																
Potassium	5000	6920		6440																	
Selenium	5	3.60		2.00	U																
Silver	10	9.00	U	9.00	U																
Sodium	5000	36200		34100																	
Thallium	10	5.00	U	5.00	U																
Vanadium	50	23.60		12.20																	
Zinc	20	3.40		3.80																	
Cyanide	10	20.00	U	N/A																	

FIL = Filtered, NV = Not Validated, N/A = Not Applicable

9613401.1578

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	WET CHEMISTRY
199-F5-45	B088P6	W	03/31/93	V	6-5
	B088P9	W	03/31/93	V	6-8
199-F1-2	B088Q0	W	04/02/93	NV	6-11, 6-12
	B088Q3	W	04/02/93	V	6-13
	B088Q4	W	04/02/93	V	6-8
199-F5-1	B088Q5	W	03/31/93	V	6-14, 6-15
	B088Q8	W	03/31/93	V	6-13
	B088Q9	W	03/31/93	V	6-8
199-F5-3	B088R0	W	04/07/93	NV	6-19, 6-20
	B088R3	W	04/07/93	NV	6-21
	B088R4	W	04/07/93	NV	6-22
199-F5-4	B088R5	W	04/05/93	NV	6-24, 6-25
	B088R8	W	04/05/93	NV	6-21
	B088R9	W	04/05/93	NV	6-22
199-F5-6	B088S5	W	04/07/93	NV	6-19, 6-20
	B088S8	W	04/07/93	NV	6-21
	B088S9	W	04/07/93	NV	6-22
199-F5-42	B088T0	W	04/05/93	NV	6-24, 6-25
	B088T3	W	04/05/93	NV	6-21
	B088T4	W	04/05/93	NV	6-22
199-F5-43A	B088T5	W	04/06/93	NV	6-26, 6-27
	B088T8	W	04/06/93	NV	6-21
	B088T9	W	04/06/93	NV	6-22
199-F5-44	B088V0	W	04/01/93	NV	6-28, 6-29
	B088V3	W	04/01/93	V	6-13
	B088V4	W	04/01/93	V	6-8
199-F5-45	B088V5	W	03/31/93	V	6-14, 6-15
	B088V8	W	03/31/93	V	6-13
	B088V9	W	3/31/93	V	6-8
199-F5-46	B088W0	W	04/03/93	NV	6-11, 6-12
	B088W3	W	04/03/93	V	6-13
	B088W4	W	04/03/93	V	6-8
199-F5-47	B088W5	W	04/07/93	NV	6-19, 6-20
	B088W8	W	04/07/93	NV	6-21
	B088W9	W	04/07/93	NV	6-22
199-F5-48	B088X0	W	04/03/93	NV	6-11, 6-12
	B088X3	W	04/03/93	V	6-13
	B088X4	W	04/03/93	V	6-8

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/V	WET CHEMISTRY
199-F6-1	B088X5	W	04/06/93	NV	6-26, 6-27
	B088X8	W	04/06/93	NV	6-21
	B088X9	W	04/06/93	NV	6-22
199-F7-1	B088Y0	W	03/31/93	V	6-14, 6-15
	B088Y3	W	03/31/93	V	6-13
	B088Y4	W	03/31/93	V	6-8
199-F7-2	B088Y5	W	04/08/93	NV	6-30, 6-31
	B088Y8	W	04/08/93	NV	6-21
	B088Y9	W	04/08/93	NV	6-22
199-F7-3	B088Z0	W	04/09/93	NV	6-32, 6-33
	B088Z3	W	04/09/93	NV	6-34
	B088Z4	W	04/09/93	NV	6-35
199-F8-2	B088Z5	W	04/12/93	V	6-36, 6-39
	B088Z8	W	04/12/93	NV	6-34
	B088Z9	W	04/12/93	NV	6-35
199-F8-3	B08900	W	04/03/93	NV	6-11, 6-12
	B08903	W	04/03/93	V	6-13
	B08904	W	04/03/93	V	6-8
199-F8-4	B08905	W	04/08/93	NV	6-30, 6-31
	B08908	W	04/08/93	NV	6-21
	B08909	W	04/08/93	NV	6-22
199-F5-45	B08910	W	03/31/93	V	6-14, 6-15
	B08913	W	03/31/93	V	6-13
	B08914	W	03/31/93	V	6-8
199-F5-47	B08915	W	04/07/93	NV	6-19, 6-20
	B08918	W	04/07/93	NV	6-21
	B08919	W	04/07/93	NV	6-23
EB 1	B08920	W	04/12/93	V	6-36, 6-39
	B08923	W	04/12/93	NV	6-34
	B08924	W	04/12/93	NV	6-35
EB 2	B08925	W	04/13/93	NV	6-40, 6-41
	B08928	W	04/13/93	NV	6-34
	B08929	W	04/13/93	NV	6-35
199-F5-47	B08930	W	04/07/93	NV	6-42
	B08933	W	04/07/93	NV	6-23

6.0 WET CHEMISTRY DATA VALIDATION

6.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6 B088P9 B088Q3 B088Q5 B088Z5

6.2 HOLDING TIMES

Analytical holding times for nitrate-nitrite, phosphate, TOX, alkalinity, hydrazine, TOC, sulfide, COD, ammonia-nitrogen, TDS, pH and specific conductance were assessed to ascertain whether the holding time requirements were met by the laboratory. The holding time requirements are as follows: twenty-eight days for nitrate-nitrite, phosphate, ammonia-nitrogen, TOC, COD and specific conductance samples; 14 days for alkalinity and hydrazine samples; 7 days for TDS, TOX and sulfide samples; 48 hours for phosphate samples; and 72 hours for pH samples under the EPA SW846 protocols.

Holding times were exceeded for pH for all samples in SDG Nos. B088Q5 and B088Z5. The associated sample results were qualified as estimates and flagged "J".

Holding times were exceeded for phosphate for all samples in SDG Nos. B088P6 and B088Z5. The associated sample results were qualified as estimates and flagged "J".

The holding time was grossly exceeded for phosphate for all samples in SDG No. B088Q5. The associated sample results were rejected and flagged "R".

Holding times were exceeded for hydrazine for sample numbers B088P9, B088Q9, B088V4, B088V9, B088Y4 and B08914 in SDG No. B088P9. The associated sample results were qualified as estimates and flagged "J".

Holding times were exceeded for TDS for sample number B08920 in SDG No. B088Z5. The associated sample result was qualified as an estimate and flagged "J".

Holding times for all other analytes reviewed met QC requirements.

6.3 CALIBRATIONS

All associated instruments were calibrated using the proper standards and procedures.

6.3.1 Initial Calibration

The following calibration procedures must be conducted:

- At least a blank and three standards were used to establish the ion chromatography, ion selective electrode, spectrophotometer, TOC analyzer and TOX analyzer calibrations prior to sample analysis and the correlation was $\geq$0.995.

The TOX instrument initial calibration was not performed for TOX analyses in SDG No. B088P6. The associated TOX result in this SDG has been rejected and flagged "R".

Insufficient initial calibration data were provided for sulfide analyses in SDG No. B088Q5. All associated sulfide results in this SDG have been rejected and flagged "R".

Insufficient initial calibration data were provided for COD analyses in SDG No. B088Q5. All associated COD results in this SDG have been rejected and flagged "R".

The titrant normality for alkalinity analysis was not verified for all samples in SDG Nos. B088P6 and B088Q5. All associated sample results were rejected and flagged "R".

All other initial calibration results were acceptable, however, ICV summary forms were not submitted.

6.3.2 Continuing Calibration Verification

All CCV standards must be analyzed with the required frequency or every 20 samples. The percent recoveries must fall within the 90-110% acceptance windows.

The continuing calibration verification (CCV) was not analyzed for pH, specific conductance, sulfide, ammonia-nitrogen, alkalinity and COD analyses in SDG No. B088Q5. All associated results have been qualified as estimates and flagged "J".

All other continuing calibration results were acceptable, however, CCV and CCB summary forms were not submitted.

6.4 BLANKS

One laboratory preparation blank is analyzed at a frequency of one every 20 samples. All blank results must fall below the CRQL and if not, all associated data <5 times the amount found in the blank is qualified as non-detected "U".

All laboratory blank results were acceptable.

6.5 ACCURACY

6.5.1 Matrix Spike Recovery

Matrix spike analyses are used to assess the analytical accuracy of the reported data and the effect of the matrix on the ability to accurately quantify sample concentrations.

The matrix spike recovery fell outside the QC limits for phosphate and nitrate-nitrite analyses for all samples in SDG No. B088Q5. All associated results have were qualified as estimates and flagged "J".

All matrix spike results were acceptable.

6.5.2 Laboratory Control Sample Recovery

The LCS monitors the overall performance of the analysis, including the sample preparation. An LCS should be prepared (e.g., digested or distilled) and analyzed with every group of samples which have been prepared together. The performance criteria for aqueous LCS percent recovery is 80 to 150 percent. The performance criteria for solid LCS samples are established through interlaboratory studies coordinated by a certifying agency (e.g., EPA or an independent commercial supplier).

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

6.6 PRECISION

Analytical duplicate sample analyses are used to measure laboratory precision and sample homogeneity. Field duplicate analyses are used to measure both the laboratory and the field sampling procedure precision.

All duplicate analyses results were acceptable for this data.

6.7 ANALYTE QUANTITATION AND DETECTION LIMITS

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

6.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicate that instrument performance was adequate for most analyses. The holding times for pH, phosphate, hydrazine and TDS exceeded the requirements for several samples. All associated results were qualified as estimates and flagged "J". The holding times for phosphate grossly exceeded the requirement for several samples. All associated results were rejected and flagged "R". Rejected data are unusable for all purposes.

Insufficient initial calibration data were provided for sulfide and COD analyses for several samples. All associated results were rejected and flagged "R". The initial calibration was not performed for TOX analysis, affecting one sample. The sample result was rejected and flagged "R".

The CCV was not analyzed for pH, conductivity, sulfide, ammonia-nitrogen, alkalinity and COD analyses for several samples. All associated results have been qualified as estimates and flagged "J".

The titrant normality for the alkalinity analysis was not verified for several samples. All associated sample results were rejected and flagged "R".

The matrix spike recovery fell outside the QC limits for phosphate and nitrate-nitrite analyses for several samples. All associated sample results were qualified as estimates and flagged "J".

As per TMA's case narrative akalinity and TDS could not be analyzed for sample B088Z5 in SDG No. B088Z5 because the sample container was broken during transport.

Except as noted above, all results are usable for all purposes.

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B088P6																				
Sample Number		B088P6																			
Location		199-F5-45																			
Remarks		Split																			
Sample Date		3/31/93																			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	7.1																			
Fluoride	300.0	0.50	U																		
Phosphate	300.0	0.25	UJ																		
pH (pH units)	150.1	7.6																			
Sulfate	300.0	24.6																			
Alkalinity	310.1	136	R																		
Tot. Dissolved Solids	160.1	247																			
Sulfide	376.1	0.10	U																		
Ammonia	350.3	0.10	U																		
COD	410.0	5.0	U																		
N03N02 (mg N/L)	353.2	3.2																			
TOC	505.0	1.1																			
TOX (ug/L)	9020.1	38.6	R																		
Spec. Conductance	120.1	355																			
(umhos/cm)																					

9613401.1585
WHC-SD-EN-TI-187, Rev. 0

HOLDING TIME SUMMARY

SDG: B088P6	REVIEWER: DW			DATE: 7/20/93		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B088P6	Phosphate	3/31/93		4/03/93		2	J

DATA QUALIFICATION SUMMARY

SDG: B088P6	REVIEWER: DW	DATE: 7/20/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Alkalinity	R	B088P6	Titrant Normality Not Verified
Phosphate	J	B088P6	Holding Time Exceeded
TOX	R	B088P6	Initial Calibration Not Performed

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: DataChem																					
Case	SDG: B088P9																				
Sample Number		B088P9		B088Q4		B088Q9		B088V4		B088V9		B088W4		B088X4		B088Y4		B08904		B08914	
Location		199-F5-45		199-F1-2		199-F5-1		199-F5-44		199-F5-45		199-F5-46		199-F5-48		199-F7-1		199-F8-3		199-F5-45	
Remarks		Split																		DUP	
Sample Date		03/31/93		04/02/93		03/31/93		04/01/93		3/31/93		04/03/93		04/03/93		03/31/93		04/03/93		03/31/93	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Hydrazine	D1385	3.0	UJ	3.0	U	3.0	UJ	3.0	UJ	3.0	UJ	3.0	U	3.0	U	3.0	UJ	3.0	U	3.0	UJ

DUP = Duplicate

9613401.1588
WHC-SD-EN-TI-187, Rev. 0

HOLDING TIME SUMMARY

SDG: B088P9	REVIEWER: DKW			DATE: 7/21/93		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B088V4	Hydrazine	4/1/93	N/A	4/16/93	N/A	14	J
B088V9	Hydrazine	3/31/93	N/A	4/16/93	N/A	14	J
B08914	Hydrazine	3/31/93	N/A	4/16/93	N/A	14	J
B088Y4	Hydrazine	3/31/93	N/A	4/16/93	N/A	14	J
B088Q9	Hydrazine	3/31/93	N/A	4/16/93	N/A	14	J
B088P9	Hydrazine	3/31/93	N/A	4/16/93	N/A	14	J

DATA QUALIFICATION SUMMARY

SDG: B088P9	REVIEWER: DKW	DATE: 7/21/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Hydrazine	J	B088V4	Holding Times Exceeded
Hydrazine	J	B088V9	Holding Times Exceeded
Hydrazine	J	B08914	Holding Times Exceeded
Hydrazine	J	B088Y4	Holding Times Exceeded
Hydrazine	J	B088Q9	Holding Times Exceeded
Hydrazine	J	B088P9	Holding Times Exceeded

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q0																				
Sample Number		B088Q0		B088W0		B088X0		B08900													
Location		199-F1-2		199-F5-46		199-F5-48		199-F8-3													
Remarks		NV		NV		NV		NV													
Sample Date		4/02/93		4/03/93		4/03/93		4/03/93													
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	10.7		17.4		22.8		9.2													
Fluoride	300.0	0.80		0.30		0.30		0.40													
Phosphate	300.0	0.40	U	0.40	U	0.40	U	0.40	U												
pH (pH units)	150.1	7.8		7.9		7.9		7.3													
Sulfate	300.0	53		68		80		59													
Alkalinity	310.1	163		176		194		513													
Tot. Dissolved Solids	160.1	311		372		438		792													
Sulfide	376.1	1.0	U	1.0	U	1.0	U	1.0	U												
Ammonia	350.3	0.05	U	0.05	U	0.05	U	0.05	U												
COD	410.0	5.0	U	5.0	U	5.0	U	8.0													
Elect. Conductivity (umhos/cm)	120.1	458		556		666		1100													

NV = Not Validated

9613401.1691

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q0																				
Sample Number		B088Q0		B088W0		B088X0		B08900													
Location		199-F1-2		199-F5-46		199-F5-48		199-F8-3													
Remarks		NV		NV		NV		NV													
Sample Date		4/02/93		4/03/93		4/03/93		4/03/93													
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	4.63		11.0		18.2		22.9													

NV = Not Validated

9613401.1592
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B088Q3																				
Sample Number		B088Q3		B088Q8		B088V3		B088V8		B088W3		B088X3		B088Y3		B08903		B08913			
Location		199-F1-2		199-F5-1		199-F5-44		199-F5-45		199-F5-46		199-F5-48		199-F7-1		199-F8-3		199-F5-45			
Remarks																		DUP			
Sample Date		4/02/93		3/31/93		4/01/93		3/31/93		4/03/93		4/03/93		3/31/93		4/03/93		3/31/93			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
TOC	505.0	0.50	U	0.50	U	0.50	U	0.88		1.2		1.5		1.2		3.2		1.1			
TOX (ug/L)	9020.1	8.6		5.0	U	5.5		15.1		16.3		12.6		23.9		45.2		18.7			

DUP = Duplicate

9613401.1593
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q5																				
Sample Number		B088Q5		B088V5		B088Y0		B08910													
Location		199-F5-1		199-F5-45		199-F7-1		199-F5-45													
Remarks								DUP													
Sample Date		3/31/93		3/31/93		3/31/93		3/31/93													
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	2.2		6.1		15.4		6.0													
Fluoride	300.0	0.2		0.3		0.8		0.3													
Phosphate	300.0	0.4	R	0.4	R	0.4	R	0.4	R												
pH (pH units)	150.1	7.8	J	8.0	J	7.6	J	8.0	J												
Sulfate	300.0	26		24		70		23													
Alkalinity	310.1	100	R	139	R	193	R	139	R												
Tot. Dissolved Solids	160.1	182		256		470		257													
Sulfide	376.1	1.0	R	1.0	R	1.0	R	1.0	R												
Ammonia	350.3	0.05	UJ	0.05	UJ	0.05	UJ	0.05	UJ												
COD	410.0	5.0	UJ	5.0	UJ	5.0	UJ	5.0	UJ												
Spec. Conductance (umhos/cm)	120.1	271	J	360	J	701	J	364	J												

DUP = Duplicate

9613401.1594

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Q5																				
Sample Number		B088Q5		B088V5		B088Y0		B08910													
Location		199-F5-1		199-F4-45		199-F7-1		199-F5-45													
Remarks								DUP													
Sample Date		3/31/93		3/31/93		3/31/93		3/31/93													
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	2.03	J	3.16	J	20.0	J	3.03	J												

DUP = Duplicate

9613401.1696
WHC-SD-EN-TI-187, Rev. 0

HOLDING TIME SUMMARY

SDG: B088Q5	REVIEWER: DKW			DATE: 7/26/93		PAGE_1_OF_1_	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B088Q5	pH	3/31/93		4/6/93		3	J
B088V5	pH	3/31/93		4/6/93		3	J
B088Y0	pH	3/31/93		4/6/93		3	J
B08910	pH	3/31/93		4/6/93		3	J
B088Q5	Phosphate	3/31/93		4/13/93		2	R
B088V5	Phosphate	3/31/93		4/13/93		2	R
B088Y0	Phospate	3/31/93		4/13/93		2	R
B08910	Phosphate	3/31/93		4/13/93		2	R

ACCURACY DATA SUMMARY

SDG: B088Q5	REVIEWER: DKW	DATE: 7/26/93	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
B088Q5S	Phosphate	68%	All	J
B088Y0S	Nitrate/Nitrite	180	All	J

DATA QUALIFICATION SUMMARY

SDG: B088Q5	REVIEWER: DKW	DATE: 7/26/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH	J	All	Holding times exceeded
Phosphate	R	All	Holding times grossly exceeded
Phosphate	J	All	Matrix spike recovery
Nitrate/Nitrite	J	All	Matrix spike recovery
Sulfide	R	All	Insufficient initial calibration data
COD	R	All	Insufficient initial calibration data
Alkalinity	R	All	Titrant normality not verified
pH	J	All	CCV not analyzed
Specific conductance	J	All	CCV not analyzed
Sulfide	J	All	CCV not analyzed
Ammonia - nitrogen	J	All	CCV not analyzed
Alkalinity	J	All	CCV not analyzed
COD	J	All	CCV not analyzed

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R0																				
Sample Number		B088R0		B088S5		B088W5		B08915													
Location		199-F5-3		199-F5-6		199-F5-47		199-F5-47													
Remarks		NV		NV		NV		DUP, NV													
Sample Date		4/07/93		4/07/93		4/07/93		4/07/93													
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	5.0		10.0		34.5		35.4													
Fluoride	300.0	0.10	U	0.40		0.40		0.30													
Phosphate	300.0	0.40	U	0.40	U	0.40	U	0.40	U												
pH (pH units)	150.1	8.0		8.3		7.7		7.7													
Sulfate	300.0	69		20		102		102													
Alkalinity	310.1	98		93		212		212													
Tot. Dissolved Solids	160.1	254		183		554		572													
Sulfide	376.1	1.0	U	1.0	U	1.0	U	1.0	U												
Ammonia	350.3	0.05	U	0.13		0.05	U	0.05	U												
COD	410.0	5.0	U	5.0	U	5.0	U	5.0	U												
Elect. Conductivity	120.1	348		257		827		830													
(umhos/cm)																					

DUP = Duplicate, NV = Not Validated

9613401.1599
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R0																				
Sample Number		B088R0		B088S5		B088W5		B08915													
Location		199-F5-3		199-F5-6		199-F5-47		199-F5-47													
Remarks		NV		NV		NV		DUP, NV													
Sample Date		4/07/93		4/07/93		4/07/93		4/07/93													
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	0.25	U	0.33		20.4		21.7													

DUP = Duplicate, NV = Not Validated

9613401.1600

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B088R3																				
Sample Number		B088R3		B088R8		B088S8		B088T3		B088T8		B088W8		B088X8		B088Y8		B08908		B08918	
Location		199-F5-3		199-F5-4		199-F5-6		199-F5-42		199-F5-43A		199-F5-47		199-F6-1		199-F7-2		199-F8-4		199-F5-47	
Remarks		NV		NV		NV		NV		NV		NV		NV		NV		NV		DUP, NV	
Sample Date		4/07/93		4/05/93		4/07/93		4/05/93		4/06/93		4/07/93		4/06/93		4/08/93		4/08/93		4/07/93	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
TOC	505.0	0.94		2.8		0.50	U	1.4		1.0		2.8		0.84		1.2		1.2		1.8	
TOX (ug/L)	9020.1	20.0	U	11.0		18.0		5.0	U	5.0	U	8.7		5.0	U	20.0	U	12.0		10.0	

NV = Not Validated, DUP = Duplicate

9613401.1601

9613401.1602

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: DataChem																			
Case	SDG: B088R4																		
Sample Number		B088R4		B088R9		B088S9		B088T4		B088T9		B088W9		B088X9		B088Y9		B08909	
Location		199-F5-3		199-F5-4		199-F5-6		199-F5-42		199-F5-43A		199-F5-47		199-F6-1		199-F7-2		199-F8-4	
Remarks		NV		NV		NV		NV		NV		NV		NV		NV		NV	
Sample Date		04/07/93		04/05/93		04/07/93		04/05/93		04/06/93		04/07/93		04/06/93		04/08/93		04/08/93	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Hydrazine	D1385	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U	3.0	U

NV = Not Validated, DUP = Duplicate

Project: WESTINGHOUSE-HANFORD																			
Laboratory: DataChem																			
Case	SDG: B088R4																		
Sample Number		B08919		B08933															
Location		199-F5-47		199-F5-47															
Remarks		NV, DUP		NV, Split															
Sample Date		04/07/93		04/07/93															
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Hydrazine	D1385	3.0	U	3.0															

NV = Not Validated, DUP = Duplicate

9613401.1603

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R5																				
Sample Number		B088R5		B088T0																	
Location		199-F5-4		199-F5-42																	
Remarks		NV		NV																	
Sample Date		4/05/93		4/05/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	32.5		1.2																	
Fluoride	300.0	0.30		0.20																	
Phosphate	300.0	0.40	U	0.40	U																
pH (pH units)	150.1	7.8		7.6																	
Sulfate	300.0	98		12																	
Alkalinity	310.1	202		83																	
Tot. Dissolved Solids	160.1	517		119																	
Sulfide	376.1	1.0	U	1.0	U																
Ammonia	350.3	0.05	U	0.05	U																
COD	410.0	5.0	U	5.0	U																
Elect. Conductivity (umhos/cm)	120.1	806		186																	

NV = Not Validated

96134014.1607
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088R5																				
Sample Number		B088R5		B088T0																	
Location		199-F5-4		199-F5-42																	
Remarks		NV		NV																	
Sample Date		4/05/93		4/05/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	20.2		0.25	U																

NV = Not Validated

9613401.1605
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088T5																				
Sample Number		B088T5		B088X5																	
Location		199-F5-43A		199-F6-1																	
Remarks		NV		NV																	
Sample Date		4/06/93		4/06/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	1.3		1.4																	
Fluoride	300.0	0.20		0.20																	
Phosphate	300.0	0.40	U	0.40	U																
pH (pH units)	150.1	8.0		8.0																	
Sulfate	300.0	14		16																	
Alkalinity	310.1	78		84																	
Tot. Dissolved Solids	160.1	121		141																	
Sulfide	376.1	1.0	U	1.0	U																
Ammonia	350.3	0.05	U	0.05	U																
COD	410.0	5.0	U	5.0	U																
Elect. Conductivity (umhos/cm)	120.1	189		202																	

NV = Not Validated

9613401.1406 SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088T5																				
Sample Number		B088T5		B088X5																	
Location		199-F5-43A		199-F6-1																	
Remarks		NV		NV																	
Sample Date		4/06/93		4/06/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	0.68		0.65																	

NV = Not Validated

9613401.1607
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088V0																				
Sample Number		B088V0																			
Location		199-F5-44																			
Remarks		NV																			
Sample Date		4/01/93																			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	4.6																			
Fluoride	300.0	0.20																			
Phosphate	300.0	0.40	U																		
pH (pH units)	150.1	7.7																			
Sulfate	300.0	29																			
Alkalinity	310.1	89																			
Tot. Dissolved Solids	160.1	169																			
Sulfide	376.1	1.0	U																		
Ammonia	350.3	0.05	U																		
COD	410.0	5.0	U																		
Elect. Conductivity (umhos/cm)	120.1	274																			

NV = Not Validated

9613401.1608
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088V0																				
Sample Number		B088V0																			
Location		199-F5-44																			
Remarks		NV																			
Sample Date		4/01/93																			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	3.65																			

NV = Not Validated

9613401.1609
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Y5																				
Sample Number		B088Y5		B08905																	
Location		199-F7-2		199-F8-4																	
Remarks		NV		NV																	
Sample Date		4/08/93		4/08/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	13.4		10.3																	
Fluoride	300.0	0.40		0.50																	
Phosphate	300.0	0.40	U	0.40	U																
pH (pH units)	150.1	8.0		7.9																	
Sulfate	300.0	64		59																	
Alkalinity	310.1	209		200																	
Tot. Dissolved Solids	160.1	414		446																	
Sulfide	376.1	1.0	U	1.0	U																
Ammonia	350.3	0.05	U	0.05	U																
COD	410.0	5.0	U	5.0	U																
Elect. Conductivity (umhos/cm)	120.1	673		707																	

NV = Not Validated

9613401.1640
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Y5																				
Sample Number		B088Y5		B08905																	
Location		199-F7-2		199-F8-4																	
Remarks		NV		NV																	
Sample Date		4/08/93		4/08/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	15.7		24.0																	

NV = Not Validated

9613401.1611

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z0																				
Sample Number		B088Z0																			
Location		199-F7-3																			
Remarks		NV																			
Sample Date		4/09/93																			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	32.6																			
Fluoride	300.0	0.60																			
Phosphate	300.0	0.40	U																		
pH (pH units)	150.1	8.0																			
Sulfate	300.0	106																			
Alkalinity	310.1	200																			
Tot. Dissolved Solids	160.1	628																			
Sulfide	376.1	1.0	U																		
Ammonia	350.3	0.05	U																		
COD	410.0	5.0	U																		
Elect. Conductivity (umhos/cm)	120.1	879																			

NV = Not Validated

9613401.1642
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z0																				
Sample Number		B088Z0																			
Location		199-F7-3																			
Remarks		NV																			
Sample Date		4/09/93																			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	26.9																			

NV = Not Validated

9613401.1613
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B088Z3																				
Sample Number		B088Z3		B088Z8		B08923		B08928													
Location		199-F7-3		199-F8-2		EB 1		EB 2													
Remarks		NV		NV		NV, EB		NV, EB													
Sample Date		4/09/93		4/12/93		4/12/93		4/13/93													
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
TOC	505.0	2.8		2.4		0.50	U	0.50	U												
TOX (ug/L)	9020.1	8.6		31.4		5.0	U	20.0	U												

NV = Not Validated, EB = Equipment Blank

9613401.1614
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																			
Laboratory: DataChem																			
Case	SDG: B088Z4																		
Sample Number		B088Z4		B088Z9		B08924		B08929											
Location		199-F7-3		199-F8-2		EB 1		EB 2											
Remarks		NV		NV		NV, EB		NV, EB											
Sample Date		04/09/93		04/12/93		04/12/93		04/13/93											
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Hydrazine	D1385	3.0	U	3.0	U	3.0	U	3.0	U										

NV = Not Validated, EB = Equipment Blank

9613401.1615

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z5																				
Sample Number		B088Z5		B08920																	
Location		199-F8-2		EB 1																	
Remarks				EB																	
Sample Date		4/12/93		4/12/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	10.1		0.20	U																
Fluoride	340.1	0.40		0.10	U																
Phosphate	300.0	0.40	UJ	0.40	UJ																
pH (pH units)	150.1	7.8	J	6.1	J																
Sulfate	375.4	79		1.0	U																
Alkalinity	310.1	* NA		2.0																	
Tot. Dissolved Solids	160.1	* NA		5.0																	
Sulfide	376.1	1.0	U	1.0	U																
Ammonia	350.3	0.05	U	0.05	U																
COD	410.0	5.0	U	5.0	U																
Elect. Conductivity (umhos/cm)	120.1	821		6.0	U																

EB = Equipment Blank, * NA = Not Available

9613401.1616

HOLDING TIME SUMMARY

SDG: B088Z5	REVIEWER: KG			DATE: 7/20/93		PAGE 1 OF 1	
COMMENTS:							
FIELD SAMPLE ID	ANALYSIS TYPE	DATE SAMPLED	DATE PREPARED	DATE ANALYZED	PREP. HOLDING TIME, DAYS	ANALYSIS HOLDING TIME, DAYS	QUALIFIER
B088Z5	pH	4/12/93		4/16/93		3	J
B08920	pH	4/12/93		4/16/93		3	J
B088Z5	Phosphate	4/12/93		4/16/93		2	J
B08920	Phosphate	4/12/93		4/16/93		2	J
B08920	TDS	4/12/93		4/19/93		7	J

DATA QUALIFICATION SUMMARY

SDG: B088Z5	REVIEWER: KG	DATE: 7/20/93	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
pH	J	B088Z5	Holding Time Exceeded
pH	J	B08920	Holding Time Exceeded
Phosphate	J	B088Z5	Holding Time Exceeded
Phosphate	J	B08920	Holding Time Exceeded
TDS	J	B08920	Holding Time Exceeded

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B088Z5																				
Sample Number		B088Z5		B08920																	
Location		199-F8-2		EB 1																	
Remarks				EB																	
Sample Date		4/12/93		4/12/93																	
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	19.6		0.25	U																

EB = Equipment Blank

9613401.1619
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: TMA																					
Case	SDG: B08925																				
Sample Number		B08925																			
Location		EB 2																			
Remarks		NV, EB																			
Sample Date		4/13/93																			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	0.20	U																		
Fluoride	300.0	0.10	U																		
Phosphate	300.0	0.40	U																		
pH (pH units)	150.1	5.5																			
Sulfate	300.0	1.0	U																		
Alkalinity	310.1	3.0																			
Tot. Dissolved Solids	160.1	5.0	U																		
Sulfide	376.1	1.0	U																		
Ammonia	350.3	0.05	U																		
COD	410.0	5.0	U																		
Elect. Conductivity	120.1	6.0	U																		
(umhos/cm)																					

EB = Equipment Blank, NV = Not Validated

9613401.1620 WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																							
Laboratory: TMA																							
Case	SDG: B08925																						
Sample Number		B08925																					
Location		EB 2																					
Remarks		NV, EB																					
Sample Date		4/13/93																					
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
N03N02	353.2	0.25	U																				

EB = Equipment Blank, NV = Not Validated

9613401.1624
WHC-SD-EN-TI-187, Rev. 0

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

Project: WESTINGHOUSE-HANFORD																					
Laboratory: Roy F. Weston																					
Case	SDG: B08930																				
Sample Number		B08930																			
Location		199-F5-47																			
Remarks		Split, NV																			
Sample Date		4/07/93																			
Analytes	Method	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloride	300.0	36.2																			
Fluoride	300.0	0.50	U																		
Phosphate	300.0	0.25	U																		
pH (pH units)	150.1	7.7																			
Sulfate	300.0	108																			
Alkalinity	310.1	205																			
Tot. Dissolved Solids	160.1	577																			
Sulfide	376.1	0.10	U																		
Ammonia	350.3	0.10	U																		
COD	410.0	5.0	U																		
N03N02 (mg N/L)	353.2	20.5																			
TOC	505.0	1.7																			
TOX (ug/L)	9020.1	38.2																			
Spec. Conductance (umhos/cm)	120.1	758																			

NV = Not Validated

WELL AND SAMPLE INFORMATION					SAMPLE LOCATION INFORMATION
SAMPLE LOCATION	SAMPLE NUMBER	MATRIX	DATE SAMPLED	NV/ V	RADIOCHEMISTRY
199-F5-45	B088P6	W	03/31/93	V	13-3
199-F1-2	B088Q0	W	04/02/93	V	13-4
199-F5-1	B088Q5	W	03/31/93	V	13-4
199-F5-3	B088R0	W	04/07/93	V	13-6
199-F5-4	B088R5	W	04/05/93	V	13-4
199-F5-6	B088S5	W	04/07/93	V	13-6
199-F5-42	B088T0	W	04/05/93	V	13-4
199-F5-43A	B088T5	W	04/06/93	V	13-4
199-F5-44	B088V0	W	04/01/93	V	13-4
199-F5-45	B088V5	W	03/31/93	V	13-4
199-F5-46	B088W0	W	04/03/93	V	13-4
199-F5-47	B088W5	W	04/07/93	V	13-6
199-F5-48	B088X0	W	04/03/93	V	13-4
199-F6-1	B088X5	W	04/06/93	V	13-4
199-F7-1	B088Y0	W	03/31/93	V	13-5
199-F7-2	B088Y5	W	04/08/93	V	13-6
199-F7-3	B088Z0	W	04/09/93	V	13-6
199-F8-2	B088Z5	W	04/12/93	V	13-6
199-F8-3	B08900	W	04/03/93	V	13-5
199-F8-4	B08905	W	04/08/93	V	13-6
199-F5-45	B08910	W	03/31/93	V	13-5
199-F5-47	B08915	W	04/07/93	V	13-6
EB 1	B08920	W	04/12/93	V	13-6
EB 2	B08925	W	04/13/93	V	13-6
199-F5-47	B08930	W	04/07/93	V	13-7

7.0 GROSS ALPHA AND GROSS BETA DETERMINATION DATA VALIDATION

7.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6	B088Q0	B088R0	B08930

7.2 HOLDING TIMES

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

All holding times were acceptable.

7.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the gas proportional counter used for gross alpha and gross beta determination is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument efficiency determination as a function of alpha or beta particle energy, and as a function of the mass of material submitted for counting. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All calibration results were acceptable.

7.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of alpha or beta emitting radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. Acceptable accuracy of spiked sample data must fall within a range of 80 to 120 percent. If spiked sample results were outside this range, the associated data were qualified as estimated (J/UJ).

Due to low LCS recoveries, all gross alpha sample results in SDG No. B088Q0 and for sample numbers B088R0, B088S5, B088W5, B088Y5, B088Z0, B088Z5, B08905 and B08915 in SDG No. B088R0 were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

7.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with activities greater than five times the LLD and with an RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All precision results were acceptable.

7.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination.

All blank results were acceptable.

7.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

Analyte quantitation and detection limits were recalculated for all samples in each data package to verify their accuracy.

All analyte quantitation and reported detection limits were acceptable.

7.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate for these analyses. Due to low LCS recoveries, several gross alpha results in SDG Nos. B088Q0 and B088R0 were qualified as estimates and flagged "J". All results with this qualification are valid and usable for limited purposes only.

All other QC and calibration results were acceptable and usable for all purposes.

8.0 ALPHA SPECTROSCOPY DATA VALIDATION

8.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6 B088Q0 B088R0 B08930

8.2 HOLDING TIMES

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

All holding times were acceptable.

8.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the alpha spectroscopy system used is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument efficiency determination for each alpha radionuclide region of interest, and a system resolution assessment as measured by the full-width at half maximum for each peak. Initial calibration was performed for each counting geometry used during the analysis of Westinghouse-Hanford samples. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All calibration results were acceptable.

8.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of alpha emitting radionuclides. The sample activity as determined by analysis is compared to the known activity to assess accuracy. The acceptable matrix spike or Laboratory Control Sample recovery range is 80 to 120 percent, while that for radiometric yields is 30 to 105%. Spike sample results outside the above ranges resulted in qualification of the associated data as estimated (J/UJ).

Due to low chemical yields, the isotopic plutonium results for sample numbers B088Q5 and B088T0 in SDG No. B088Q0; and for sample numbers B088R0, B088S5, B088Y5, B088Z0, B088Z5, B08905, and B08915 in SDG No. B088R0 were rejected and flagged "R".

Due to low chemical yields, the americium-241 result for sample number B088X5 in SDG No. B088Q0 was rejected and flagged "R".

All other accuracy results were acceptable.

8.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate samples. Replicates with a RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All precision results were acceptable.

8.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results are due to laboratory reagent, sample container, or detector contamination.

All blank results were acceptable.

8.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

Analyte quantitations and detection limits were recalculated for all samples in each data delivery package to verify their accuracy.

All analyte quantitation and reported detection limits were acceptable.

8.8 OVERALL ASSESSMENT AND SUMMARY

A complete review of all QC and calibration data indicates that overall system performance was adequate. Due to accuracy problems, some isotopic plutonium and americium-241 results in SDG Nos. B088Q0 and B088R0 were rejected and flagged "R". Rejected results are unusable for all purposes. All other QC and calibration data were acceptable and usable for all purposes.

9.0 GAMMA SPECTROSCOPY DATA VALIDATION

9.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6 B088Q0 B088R0 B08930

9.2 HOLDING TIMES

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

All holding times were acceptable.

9.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the gamma spectroscopy system used is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument efficiency determination for each gamma radionuclide region of interest, and a system resolution assessment as measured by the full-width at half maximum for each peak. Initial calibration was performed for each counting geometry used during the analysis of Westinghouse-Hanford samples. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

Due to inadequate check source traceability, all samples in SDG No. B088P6 were qualified as estimated and flagged "J".

All other calibration results were acceptable.

9.4 ACCURACY

Accuracy was evaluated by analyzing soil or distilled water samples spiked with known amounts of gamma emitting radionuclides. The sample activity as determined by sample analysis is compared to the known activity to assess accuracy. The acceptable spiked recovery range is 80 to 120 percent. If spiked sample results were outside this range the associated data were qualified as estimated (J/UJ).

All accuracy results were acceptable.

9.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with a RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All precision results were acceptable.

9.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results may be due to laboratory reagent, sample container, or detector contamination.

All blank results were acceptable.

9.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

Analyte quantitations and detection limits were recalculated for all samples in each data delivery package to verify their accuracy.

All analyte quantitation and reported detection limits were acceptable.

9.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate for these analyses. Due to inadequate standard traceability, all samples in SDG No. B088P6 were qualified as estimated and flagged "J". Data with this qualification are valid and usable for limited purposes only. All other results are acceptable and usable for all purposes.

10.0 STRONTIUM-90 DETERMINATION DATA VALIDATION

10.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6 B088Q0 B088R0 B08930

10.2 HOLDING TIMES

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

All holding times were acceptable.

10.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the low background counting system used for strontium-90 determination is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument detection efficiency determination. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All calibration results were acceptable.

10.4 ACCURACY

All spike recoveries should be within the specified QC range of 80 to 120 percent, while all radiotraced samples should show a radiometric yield or recovery between 30 and 105%. Spiked sample results outside the above ranges resulted in qualification of the associated data as estimated.

All accuracy results were acceptable.

10.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with an RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All precision results were acceptable.

10.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results may be due to laboratory reagent, sample container, or detector contamination.

All blank results were acceptable.

10.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

Analyte quantitation and detection limits were recalculated for all samples in each data delivery package to verify their accuracy.

All analyte quantitation and reported detection limits were acceptable.

10.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate for these analyses. All results are acceptable and usable for all purposes.

11.0 TECHNETIUM-99 DETERMINATION DATA VALIDATION

11.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6 B088Q0 B088R0 B08930

11.2 HOLDING TIMES

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

All holding times were acceptable.

11.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the low background counting system used for technetium-99 determination is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument detection efficiency determination. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All calibration results were acceptable.

11.4 ACCURACY

All spike recoveries should be within the specified QC range of 80 to 120 percent, while all radiotraced samples should show a radiometric yield or recovery between 30 and 105%. Spiked sample results outside the above ranges resulted in qualification of the associated data as estimated.

Due to low chemical yields, technetium-99 results for the following samples were rejected and flagged "R":

- Sample number B088P6 in SDG No. B088P6.
- Sample number B088Z5 in SDG No. B088R0.

All other accuracy results were acceptable.

11.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with an RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All precision results were acceptable.

11.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results may be due to laboratory reagent, sample container, or detector contamination.

All blank results were acceptable.

11.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

Analyte quantitation and detection limits were recalculated for all samples in each data delivery package to verify their accuracy.

All analyte quantitation and reported detection limits were acceptable.

11.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument continuing calibration information and QC data indicates that instrument performance was adequate for these analyses. Due to accuracy problems, a few technetium-99 results in SDG Nos. B088P6 and B088R0 were rejected and flagged "R". Rejected data are unusable for all purposes and should not be reported. All other results are acceptable and usable for all purposes.

12.0 CARBON-14 DETERMINATION DATA VALIDATION

12.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6 B088Q0 B088R0 B08930

12.2 HOLDING TIMES

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

All holding times were acceptable.

12.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the low background liquid scintillation counting system used for carbon-14 determination is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument efficiency determination for each applicable radionuclide. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All calibration results were acceptable.

12.4 ACCURACY

All spike recoveries should be within the specified QC range of 80 to 120 percent, while all radiometric yields should fall within the range of 30 to 105%. Spiked sample results outside the above ranges resulted in qualification of the associated data as estimated (J/UJ).

Due to high LCS recoveries, the carbon-14 result for sample number B08930 in SDG No. B08930 was rejected and flagged "R".

Due to low LCS recoveries, the carbon-14 results for B088R0, B088S5, B088W5, B088Y5, B088Z0, B088Z5, B08905 and B08915 in SDG No. B088R0 were qualified as estimates and flagged "J".

All other accuracy results were acceptable.

12.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with a RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

Due to RPDs out of specification, all carbon-14 sample results in SDG No. B088Q0 were qualified as estimated and flagged "J".

All other precision results were acceptable.

12.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results may be due to laboratory reagent, sample container, or detector contamination.

All blank results were acceptable.

12.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

Analyte quantitation and detection limits were recalculated for all samples in each data delivery package to verify their accuracy.

All analyte quantitation and reported detection limits were acceptable.

12.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument performance and calibration indicates that the overall system performance is adequate. Due to low LCS recoveries, carbon-14 sample results in SDG No. B088R0 were qualified as estimates and flagged "J". High LCS recoveries resulted in the rejection of all carbon-14 results in SDG No. B08930. Rejected data are unusable for all purposes and should not be reported. Due to poor RPDs, all carbon-14 sample results in SDG No. B088Q0 were qualified as estimates and flagged "J". Data qualified as estimated are valid and usable for limited purposes only. All other QC and calibration results are acceptable and usable for all purposes.

13.0 TRITIUM DETERMINATION DATA VALIDATION

13.1 DATA PACKAGE COMPLETENESS

The following data packages (SDG Nos.) were submitted for validation and found to be complete:

B088P6	B088Q0	B088R0	B08930

13.2 HOLDING TIMES

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

All holding times were acceptable.

13.3 INSTRUMENT CALIBRATION AND PERFORMANCE

Instrument calibration is performed to establish that the low background liquid scintillation counting system used for tritium determination is capable of producing acceptable and reliable analytical data. The initial calibration was performed according to manufacturer's recommendations and consists of an instrument efficiency determination for each applicable radionuclide. Continuing calibration checks are performed to verify that instrument performance is stable and reproducible on a day-to-day basis.

All calibration results were acceptable.

13.4 ACCURACY

All spike recoveries should be within the specified QC range of 80 to 120 percent, while all radiometric yields should fall within the range of 30 to 105%. Spiked sample results outside the above ranges resulted in qualification of the associated data as estimated (J/UJ).

All accuracy results were acceptable.

13.5 PRECISION

Analytical precision is expressed by the RPD between the recoveries of duplicate matrix spike analyses performed on a sample. When the laboratory has not performed duplicate spike analyses, precision may also be assessed using unspiked duplicate sample analyses. Replicates with a RPD less than 35 percent are acceptable. If duplicate activities are both <5xLLD, a control limit of 2xLLD is used. If replicate values are both below the LLD, no control limit is applicable. If the RPD is outside the applicable control limit, associated results are qualified as estimated detects (J) or estimated non-detects (UJ).

All precision results were acceptable.

13.6 BLANK SAMPLES

Blank samples are analyzed to determine if positive results may be due to laboratory reagent, sample container, or detector contamination.

All blank results were acceptable.

13.7 ANALYTE QUANTITATION AND REPORTED DETECTION LIMITS

Analyte quantitation and detection limits were recalculated for all samples in each data delivery package to verify their accuracy.

All analyte quantitation and reported detection limits and sample results were acceptable.

13.8 OVERALL ASSESSMENT AND SUMMARY

A review of instrument performance and calibration indicates that the overall system performance is adequate. All QC and calibration results were acceptable and usable for all purposes.

RADIOCHEMISTRY ANALYSIS, WATER MATRIX, (pCi/L+-2 standard deviations)

Project: WESTINGHOUSE-HANFORD																				
Laboratory: Teledyne																				
Case	SDG: B088P6																			
Sample Number	B088P6																			
Location	199-F5-45																			
Remarks	Split																			
Sample Date	3/31/93																			
Analysis Date	5/10/93																			
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	3.3																			
Gross Beta	8.4																			
Uranium-235	0.011	U																		
Uranium-238	1.0																			
Plutonium-239	-0.098	U																		
Americium-241	0.024	U																		
Strontium-90	1.6																			
Technetium-99	1.8	R																		
Tritium	590																			
Carbon-14	8.1	U																		
Beryllium-7	-4.2	UJ																		
Potassium-40	-66	UJ																		
Manganese-54	1.4	UJ																		
Cobalt-58	-1.7	UJ																		
Iron-59	3.2	UJ																		
Cobalt-60	-1.2	UJ																		
Zinc-65	4.1	UJ																		
Zirconium-95	-3.0	UJ																		
Ruthenium-103	3.1	UJ																		
Ruthenium-106	-17	UJ																		
Iodine-131	2.0	UJ																		
Cesium-134	3.2	UJ																		
Cesium-137	0	UJ																		
Barium-140	0	UJ																		
Cerium-141	-6.9	UJ																		
Cerium-144	-25	UJ																		
Europium-152	-6.2	UJ																		
Europium-154	-2.7	UJ																		
Europium-155	-37	UJ																		
Radium-226	20	UJ																		
Thorium-228	15.9	J																		
Thorium-234	-120	UJ																		

9613401.1640

Project: WESTINGHOUSE HANFORD																				
Laboratory: TMA																				
Case	SDG: B088Q0																			
Sample Number	B088Q0		B088Q5		B088R5		B088T0		B088T5		B088V0		B088V5		B088W0		B088X0		B088X5	
Location	199-F1-2		199-F5-1		199-F5-4		199-F5-42		199-F5-43A		199-F5-44		199-F5-45		199-F5-46		199-F5-48		199-F6-1	
Remarks																				
Sample Date	4/02/93		3/31/93		4/05/93		4/05/93		4/06/93		4/01/93		3/31/93		4/03/93		4/03/93		4/06/93	
Analysis Date	5/18/93		5/18/93		5/18/93		5/18/93		5/18/93		5/18/93		5/18/93		5/18/93		5/18/93		5/18/93	
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	1.4	UJ	-0.45	UJ	5.2	J	0.18	UJ	0.63	UJ	1.4	UJ	0.72	UJ	1.7	UJ	5.4	J	-0.56	UJ
Gross Beta	5.5		51		7.4		9.2		6.7		14		4.7		30		7.8		2.8	J
Uranium-233/234	2.2		0.68		4.0		0.42		0.24		0.40		1.4		2.9		3.9		0.72	
Uranium-235	0.083	U	0.034	U	0.084	U	0.023	U	0.021	U	0.023	U	0.11	J	0.30		0.22		0.043	U
Uranium-238	1.7		0.68		3.0		0.35		0.23		0.50		1.2		2.5		3.3		0.57	
Plutonium-238	-0.031	U	-0.011	R	-0.003	U	-0.011	R	0.006	U	0.003	U	0.017	U	-0.003	U	-0.015	U	-0.005	U
Plutonium-239/240	0.004	U	0.006	R	-0.005	U	0.006	R	0.003	U	0.003	U	-0.003	U	-0.005	U	0	U	-0.002	U
Americium-241	0.020	U	0	U	0.003	U	0	U	0	U	0.005	U	0.017	U	-0.024	U	0.004	U	-0.003	R
Strontium-90	0.16	U	24		0.10	U	2.6		2.7		6.6		0.003	U	13		-0.079	U	0.035	U
Technetium-99	3.1	U	0.070	U	1.1	U	-0.61	U	1.6	U	1.4	U	1.5	U	0.16	U	0.69	U	0.60	U
Tritium	170	U	320	J	8800		59	U	19	U	580		560		5100		13000		18	U
Carbon-14	-9.3	UJ	5.3	UJ	-0.46	UJ	120	J	3.4	UJ	-12	UJ	-2.1	UJ	10	UJ	17	UJ	39	J
Potassium-40	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Iron-59	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Chromium-51	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cobalt-60	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Zinc-65	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Ruthenium-106	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cesium-134	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cesium-137	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cerium-144	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Europium-152	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Europium-154	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Radium-226	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Thorium-228	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Thorium-232	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U

ND = Not Detected, DUP = Duplicate, EB = Equipment Blank

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Project: WESTINGHOUSE HANFORD																				
Laboratory: TMA																				
Case	SDG: B088Q0																			
Sample Number	B088Y0		B08900		B08910															
Location	199-F7-1		199-F8-3		199-F5-45															
Remarks					DUP															
Sample Date	3/31/93		4/03/93		3/31/93															
Analysis Date	5/18/93		5/19/93		5/18/93															
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	4.3	J	2.8	UJ	1.3	UJ														
Gross Beta	8.0		87		4.7															
Uranium-233/234	2.9		6.1		1.6															
Uranium-235	0.19	J	0.36		0.15	J														
Uranium-238	2.7		5.3		1.3															
Plutonium-238	-0.015	U	0.017	U	0.004	U														
Plutonium-239/240	-0.003	U	0.020	U	0.021	U														
Americium-241	0.006	U	0.027	U	0.015	U														
Strontium-90	0.020	U	0.051	U	-0.11	U														
Technetium-99	1.2	U	2.0	U	1.6	U														
Tritium	420		180000		620															
Carbon-14	-3.8	UJ	330	J	6.0	UJ														
Potassium-40	N/D	U	N/D	U	N/D	U														
Iron-59	N/D	U	N/D	U	N/D	U														
Chromium-51	N/D	U	N/D	U	N/D	U														
Cobalt-60	N/D	U	N/D	U	N/D	U														
Zinc-65	N/D	U	N/D	U	N/D	U														
Ruthenium-106	N/D	U	N/D	U	N/D	U														
Cesium-134	N/D	U	N/D	U	N/D	U														
Cesium-137	N/D	U	N/D	U	N/D	U														
Cerium-144	N/D	U	N/D	U	N/D	U														
Europium-152	N/D	U	N/D	U	N/D	U														
Europium-154	N/D	U	N/D	U	N/D	U														
Radium-226	N/D	U	N/D	U	N/D	U														
Thorium-228	N/D	U	N/D	U	N/D	U														
Thorium-232	N/D	U	N/D	U	N/D	U														

ND = Not Detected, DUP = Duplicate, EB = Equipment Blank

9613401.1642
WHC-SD-EN-TI-187, Rev. 0

RADIOCHEMISTRY ANALYSIS, WATER MATRIX, (pCi/L+-2 standard deviations)

Project: WESTINGHOUSE-HANFORD
Laboratory: TMA
Case | SDG: B088R0

Sample Number	B088R0		B088S5		B088W5		B088Y5		B088Z0		B088Z5		B08905		B08915		B08920		B08925	
Location	199-F5-3		199-F5-6		199-F5-47		199-F7-2		199-F7-3		199-F8-2		199-F8-4		199-F5-47		EB-1		EB-2	
Remarks															DUP		EB		EB	
Sample Date	4/07/93		4/07/93		4/07/93		4/08/93		4/09/93		4/12/93		4/08/93		4/07/93		4/12/93		4/13/93	
Analysis Date	5/21/93		5/21/93		5/21/93		5/21/93		5/22/93		5/22/93		5/22/93		5/21/93		5/22/93		5/22/93	
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	-7.8	UJ	0.15	UJ	2.0	UJ	0.71	UJ	1.4	UJ	7.8	J	2.4	UJ	5.5	J	-0.62	U	-0.64	U
Gross Beta	480		9.0		11		8.5		8.3		12		6.9		10		0.38	U	0.30	U
Uranium-233/234	0.097	U	0.25		3.6		3.3		2.4		8.8		4.3		5.1		0.015	U	0.047	U
Uranium-235	0.029	U	0	U	0.21		0.13	J	0.11	J	0.44		0.20		0.21		0	U	-0.019	U
Uranium-238	0.085	U	0.16	J	3.4		2.4		2.0		8.7		3.1		3.8		0.030	U	0.031	U
Plutonium-238	0.003	R	-0.005	R	-0.005	U	0	R	0.006	R	0.006	R	0	R	0	R	0.005	U	-0.013	U
Plutonium-239/240	0.003	R	0.005	R	0	U	0.004	R	0	R	0	R	-0.003	R	0.017	R	0	U	0.004	U
Americium-241	-0.015	U	0.011	U	0.002	U	0	U	-0.003	U	-0.010	U	0	U	0	U	0.008	U	0	U
Strontium-90	220		1.1	J	0.95	U	-0.13	U	0.082	U	-0.061	U	-0.045	U	1.5	J	0.084	U	0.10	U
Technetium-99	0.47	U	1.8	U	0.93	U	2.0	U	1.6	U	0.76	R	1.0	U	0.71	U	2.2	U	1.2	U
Tritium	810		500		12000		430		1400		1700		11000		12000		88	U	170	U
Carbon-14	-47	UJ	-25	UJ	-14	UJ	150	J	110	J	2.5	UJ	22	UJ	350	J	-33	U	-10	U
Potassium-40	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Iron-59	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Chromium-51	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cobalt-60	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Zinc-65	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Ruthenium-106	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cesium-134	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cesium-137	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Cerium-144	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Europium-152	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Europium-154	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Radium-226	N/D	U	N/D	U	17		N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Thorium-228	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U
Thorium-232	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U	N/D	U

N/D = Not Detected, DUP = Duplicate, EB = Equipment Blank

9613401.1643
WHC-SD-EN-TI-187, Rev. 0

Project: WESTINGHOUSE-HANFORD																				
Laboratory: Teledyne																				
Case	SDG: B08930																			
Sample Number	B08930																			
Location	199-F5-47																			
Remarks	Split																			
Sample Date	4/07/93																			
Analysis Date	5/18/93																			
Radiochemistry Analysis	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Gross Alpha	6.5																			
Gross Beta	18																			
Uranium-235	0.10	U																		
Uranium-238	3.8																			
Plutonium-239	0.02	U																		
Americium-241	0.0046	U																		
Strontium-90	3.8																			
Technetium-99	0.89	U																		
Tritium	12000																			
Carbon-14	2.6	R																		
Beryllium-7	18	U																		
Potassium-40	-110	U																		
Manganese-54	2.3	U																		
Cobalt-58	-2.6	U																		
Iron-59	5.2	U																		
Cobalt-60	0	U																		
Zinc-65	4.5	U																		
Zirconium-95	0	U																		
Ruthenium-103	-0.66	U																		
Ruthenium-106	-3.9	U																		
Iodine-131	15	U																		
Cesium-134	-2.2	U																		
Cesium-137	-1.4	U																		
Barium-140	1.6	U																		
Cerium-141	-6.2	U																		
Cerium-144	-8.6	U																		
Europium-152	-1.6	U																		
Europium-154	0	U																		
Europium-155	-40	U																		
Radium-226	-18	U																		
Thorium-228	-0.054	U																		
Thorium-234	-37	U																		

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