START 9613441.1474 9/ 0000010 9205L304-WES-421

0044096

ROY F. WESTON, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 05-13-92
RFW #: 9205L304, GC/MS VOLATILE
W.O. #: 6168-02-01

NARRATIVE

One (1) water sample was collected on 05-11-92.

The sample and its associated QC samples were analyzed according to criteria set forth in CLP SOW 02/88 (Rev. 05/89) for TCL Volatile target compounds on 05-14-92.

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 surrogate recoveries were within EPA QC limits.

3. All matrix spike recoveries were within EPA QC limits.

4. The laboratory blank contained the common contaminant Acetone at a level less than the CRQL.

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

06.17.92
Date

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

sma/voa/05-304v.cn

Task # 92-145

WESTON Analytics Use Only: 9205L304

Custody Transfer Record/Lab Work Request

WESTON

Page 1 of 1

Client: Westinghouse Hanford
Est. Final Proj. Sampling Date:
Work Order #: 6168-02-01-0000
Project Contact/Phone #: PH Butcher (509) 376-5045
AD Project Manager: Josie King
QC: Del: TAT: 35 day
Date Rec'd: 5-13-92 Date Due: 6-17-92
Account #: WS-HANFORD

Refrigerator #: 4

#/Type Container																	
	Liquid	6GS				1 Gs	1 Gs										
	Solid																
Volume	Liquid	40ML				250 ml	250 ml										
	Solid																
Preservatives							H_2SO_4										
ANALYSES REQUESTED		VOA	BNA	Pest/PCB	Herb		TOX	TOC		Metal	CN						

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

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	VOA	BNA	Pest/PCB	Herb	TOX	TOC	Metal	CN
							0344				VOID 5-14-92	VOID 5-14-92		
001	D062R3, 6,40ML GS.			W	5-1-92	1035	✓							

WESTON Analytics Use Only

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Special Instructions:
BOL # 2509867987
OPC # W92-0-0345-32

① MS/MSD Required

DATE/REVISIONS: RAD INFO TO FOLLOW
1.
2.
3.
4.
5.
6.

WESTON Analytics Use Only

Samples were:
1) Shipped ✓ or Hand Delivered
Airbill # 2509867987
2) Ambient or Chilled
3) Received in Good Condition (Y) or N
4) Labels Indicate Properly Preserved (Y) or N
5) Received Within Holding Times (Y) or N

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

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

Relinquished by	Received by	Date	Time
Emery	[signature]	5-13-92	11:20
[signature]		5-13-92	

Relinquished by	Received by	Date	Time
	[signature]	5-13-92	

RFW 21-21-001/A-7/91 ____ L372 ____ L373 ____ L375 ____ L377 ____ L378 Ref# N/A Cooler# 2ML-61 381-596a

9613441.1475

000002

9613441.1476 0000003

Westinghouse Hanford Company

CHAIN OF CUSTODY

92052-304

Custody Form Initiator PH BUTCHER

Company Contact PH BUTCHER

Telephone (509)376-5045

Project Designation/Sampling Locations 300-FF-5

Collection Date 5-11-92

Ice Chest No. SML-61

Field Logbook No. EFL-1006

Bill of Lading/Airbill No. 2509867987

Offsite Property No. W92-0-0345-32

Method of Shipment EMERY

Shipped to WESTON

Possible Sample Hazards/Remarks N/A

Sample Identification

BO62R3
6, 40ml, Gs, WATER, VOA

[] Field Transfer of Custody	Chain of Possession	(Sign and Print Names)
Relinquished by: K. Trapp / K. Trapp	Received by: refrigerator	Date/Time: 5/11/92 1605
Relinquished by:	Received by: B. WHITTEN	Date/Time: 5-12-92 / 0700
Relinquished by: B. WHITTEN	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time: 5-13-92 11:20

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-407 (12/90) (EF) WEF061
Chain of Custody

FORM OF PAYMENT

9613441 1477

Check ☐ COD ☐ FCCCD ☐

9205L 304 0000

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

Shipper's Account Number 850281585

EMERY WORLDWIDE

A CF Company

SERVICES

UNITED STATES / CANADA: Same Day ☐ AM ☐ PM ☐ Second Day ☐ Saturday Delivery ☐

INTERNATIONAL: Express ☐ Priority ☐ Standard ☐ Buyer Docu Cust Clear Da

Date 05-12-92 Origin PSC Shipment Number 986758

From: WESTINGHOUSE SHIPPING DEPT (509) 376-6665
U S DEPARTMENT OF ENERGY C/O
ESTINGHOUSE HANFORD
BLDG 1163
355 STEVENS DRIVE
ICHLAND WA Canada ☐

To: JOSIE KING
rf weston INC
208 WELSH POOL ROAD
LIONVILLE PA Canada ☐

Tariff Dest.

Check to Shipper $

EMERY WORLD will accept Con check with all billing assumec Shipper, includ but not limited non-payment, t and misrepresen

Customer's Reference Numbers: 480230 PC2CA W92-0-0345#32

Zip: 99352

E

Consignee's Account Number

Zip: 19341

Description	Pcs.	L	W	H	Total Pieces	Total Weight (in Lbs.)
COOLER ID; SML-61 ATER SAMPLES 062R3 ~~92-0-0345#32~~	1	12	12	12	1	35

FOR INFORMATION OR RATES CALL 1-800 44 EMERY (1-800-443-6379)

Declared Va. $

250986798 7

VERNIGHT DELIVERY
IGNATURE SECURITY SERVICE

Shipper's Signature X

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 in the area to the right, apply.

Mark if Emery Packaging is used: Urgent Letter 9X12 ☒ Urgent Pack 12X15 ☒

3-PHL-1

International Shipments: Free Domicile ☑ Commodity Code

Third Party Account Number mandatory for Third Party Billing. E Third Party Account Number

International Customs Value International Insurance

se Charge

Total Transportation Charges Other Charges/Advance at Origin ☐ OCA/O- $

Terms and Conditions on Back

EMERY WORLDWIDE A CF Company 9205L 304

SIGNATURE AND TALLY RECORD

60029-46 (8/89) Litho USA

DATE: 05-12-92 SHIPMENT NO.: 250986798 7
SHIPPER: WESTINGHOUSE SHIPPING DEPT (509) 376-6
REFERENCE NO.: W92-0-0345#32

SHIPPER NAME AND ADDRESS
WESTINGHOUSE SHIPPING DEPT (509) 376-6665
G2-06 U S DEPARTMENT OF ENERGY C/O
WESTINGHOUSE HANFORD COMPANY
2355 STEVENS DRIVE 1163 BUILDING
PO BOX 1970
RICHLAND WA 99352

CONSIGNEE NAME AND ADDRESS
JOSIE KING
RF WESTON INC
208 WELSH POOL ROAD
LIONVILLE PA 19341

Pieces	Weight	Description/Marks	Emery Authorization No.

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.	Ted Vance EWW	PSC	Ted Vance	1530 5-12-
4.				
5.				
6.	Fran DiLossi	PHL.	Fran DiLossi	10:15 5-13
7.	W.D SNYDER	PHL	W Snyder	10:15/1
8.	S.E. Perks	Wonville	S Perks	5/13/92 11:0

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

RFW Batch Number: 9205L304 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-01-0000 Report Date: 06/16/92 10:29 Page: 1a

	Cust ID:	B062R3		B062R3		B062R3		VBLK	
Sample Information	RFW#:	001		001 MS		001 MSD		92LVR026-MB1	
	Matrix:	WATER		WATER		WATER		WATER	
	D.F.:	1.00		1.00		1.00		1.00	
	Units:	ug/L		ug/L		ug/L		ug/L	
Surrogate Recovery	Toluene-d8	106	%	96	%	93	%	102	%
	Bromofluorobenzene	99	%	93	%	90	%	98	%
	1,2-Dichloroethane-d4	101	%	110	%	108	%	106	%
Chloromethane		10	U	10	U	10	U	10	U
Bromomethane		10	U	10	U	10	U	10	U
Vinyl Chloride		10	U	10	U	10	U	10	U
Chloroethane		10	U	10	U	10	U	10	U
Methylene Chloride		5	U	5	U	5	U	5	U
Acetone		3	JB	3	JB	3	JB	5	J
Carbon Disulfide		5	U	5	U	5	U	5	U
1,1-Dichloroethene		5	U	86	%	95	%	5	U
1,1-Dichloroethane		5	U	5	U	5	U	5	U
1,2-Dichloroethene (total)		88		85		85		5	U
Chloroform		5	U	5	U	5	U	5	U
1,2-Dichloroethane		5	U	5	U	5	U	5	U
2-Butanone		10	U	10	U	10	U	10	U
1,1,1-Trichloroethane		5	U	5	U	5	U	5	U
Carbon Tetrachloride		5	U	5	U	5	U	5	U
Vinyl Acetate		10	U	10	U	10	U	10	U
Bromodichloromethane		5	U	5	U	5	U	5	U
1,2-Dichloropropane		5	U	5	U	5	U	5	U
cis-1,3-Dichloropropene		5	U	5	U	5	U	5	U
Trichloroethene		11		100	%	99	%	5	U
Dibromochloromethane		5	U	5	U	5	U	5	U
1,1,2-Trichloroethane		5	U	5	U	5	U	5	U
Benzene		5	U	91	%	90	%	5	U
Trans-1,3-Dichloropropene		5	U	5	U	5	U	5	U
Bromoform		5	U	5	U	5	U	5	U
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U
2-Hexanone		10	U	10	U	10	U	10	U
Tetrachloroethene		5	U	5	U	5	U	5	U
1,1,2,2-Tetrachloroethane		5	U	5	U	5	U	5	U

*= Outside of EPA CLP QC limits.

9613441.1478 0000006

Cust ID:	BO62R3	BO62R3	BO62R3	VBLK
RFW#:	001	001 MS	001 MSD	92LVR026-MB1
Toluene	5 U	80 %	80 %	5 U
Chlorobenzene	5 U	91 %	91 %	5 U
Ethylbenzene	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

9613441.1479 0000007

WESTON

ADDENDUM

I certify that this data package is in compliance with the terms and conditions of this contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

Signature: [signature] Name: SOM N. BASUTHAKUR

Date: 06.17.92 Title: UNIT - LEADER

pas\4-92\addendum

9613441.1481

1A 0000021

VOLATILE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

B062R3

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-01-0000

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9205L304-001

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

Lab File ID: R051407

Level: (low/med) LOW

Date Received: 05/13/92

% Moisture: not dec. _____

Date Analyzed: 05/14/92

Column: (pack/cap) CAP

Dilution Factor: 1.00

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

CAS NO.	COMPOUND		
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	3	JB
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	88	
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	11	
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

9613441.1482
1E
0000022

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B062R3,6,40MLGS

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-01-0000

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9205L304-001

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

Lab File ID: R051407

Level: (low/med) LOW

Date Received: 05/13/92

% Moisture: not dec. _____

Date Analyzed: 05/14/92

Column: (pack/cap) CAP

Dilution Factor: 1.00

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 12/88 Rev.

9613441.1483 9205L304-WRS-421 Tr 1292

HCRL-WHC/9306-T-92-047 E-93-06/2978-50

WESTINGHOUSE HANFORD COMPANY
300-FF-5 RI DATA VALIDATION
DISTRIBUTION FORM

Document Title: Prelim. QA Record – Weston Case # 9205L3

Document Number: HCRL-WHC/9306-L-92-048 Date: December 11, 1992

DISTRIBUTION

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P. Bartley (ERL)		T. McDonald (HCRL)		D. Wiley (ERL)	
Y. Chun (HCSEA)		R. Potter (HCRL)		N. Wold (ERL)	
B. Downs (HCSEA)	X	K. Rolla (HCSEA)		Project File (HCRL)	X
M. Gerboth (HCRL)	X	C. Russel (HCSEA)	X	Duplicate Project File (HCSEA)	X
J. Grover (ERL)	X	C. Sater (ERL)		Westinghouse EDMC	X
L. Hammerle (HCSEA)		M. Schwartz (ERL)		ERL File	X
L. Hulstrom (WHC)		A. Shen (HCSEA)			

Project Files (1=Adm; 2=Corres; 3=Source Information; 4=Technical Data & Products)

1.1 File Index		2.1 Incoming Correspondence		4.4.5 Biota/Small Mammals	
1.2 Distribution Lists		2.2 Outgoing Correspondence	X	4.4.6 Surface Water Sediments	
1.3 Project Procedures		2.3 Internal Correspondence		4.5 Data Val. & Qual. Summary Rpts.	
1.4 Project Modifications				4.5.1 Round 1 Groundwater	
1.5.1 Staff Resumes		3.1 Task Order		4.5.1.1 Internal Drafts/Comments/Resol.	
1.5.2 Staff Training		3.2 Sample Lists		4.5.1.2 WHC Review Draft/Comments/Resol.	
1.5.3 Auth.-Former Site Employee		3.3 Data Validation Procedures		4.5.1.3 Final Report	
1.6.1 QA Manual		3.4 Original Chemical Data		4.5.2 Round 2 Groundater	
1.6.2 QA Implementation		3.5 Original Radiochem Data		4.5.2.1 Internal Drafts/Comments/Resol.	
1.6.3.1 QA Audits-Deliverables				4.5.2.2 WHC Review Draft/Comments/Resol.	
1.6.3.2 QA Audits-Files		4.1 Task Plan		4.5.2.3 Final Report	
1.6.4.1 Audit Resps-Deliverables		4.2 Data Pkg. Completeness Verif.		4.5.3 Round 3 Groundwater	
1.6.4.2 Audit Resps-Files		4.2.1 Checklists - Round 1 GW		4.5.3.1 Internal Drafts/Comments/Resol.	
1.6.5 Training		4.2.2 Checklists - Round 2 GW		4.5.3.2 WHC Review Draft/Comments/Resol.	
1.6.6.1 QA Manual Doc Log		4.2.3 Checklists - Round 3 GW		4.5.3.3 Final Report	
1.6.6.2 Procedures Doc Log		4.2.4 Checklists - Round 4 GW		4.5.4 Round 4 Groundwater	
1.6.6.3 Plans Document Log		4.2.5 Checklists - Biota/Small Mam.		4.5.4.1 Internal Drafts/Comments/Resol.	
1.6.6.4 Deliverables Doc Log		4.2.6 Checklists - Surface Wtr./Sed.		4.5.4.2 WHC Review Draft/Comments/Resol.	
1.7.1 Downloads		4.3 Data Val. Calcs./Annotated DP		4.5.4.3 Final Report	
1.7.2 M-113s		4.3.1 Round 1 Groundwater		4.5.5 Biota/Small Mammals	
1.7.3 A-208s		4.3.2 Round 2 Groundwater		4.5.5.1 Internal Drafts/Comments/Resol.	
1.7.4 Budget Status		4.3.3 Round 3 Groundwater		4.5.5.2 WHC Review Draft/Comments/Resol.	
1.7.5 Invoices		4.3.4 Round 4 Groundwater		4.5.5.3 Final Report	
1.8.1 Requisitions		4.3.5 Biota/Small Mammals		4.5.6 Surface Water/Sediments	
1.9 Meeting Minutes		4.3.6 Surface Water/Sediments		4.5.6.1 Internal Drafts/Comments/Resol.	
1.10 Record of Telecons		4.4 Preliminary QA Records		4.5.6.2 WHC Review Draft/Comments/Resol.	
1.11 Progress Reports		4.4.1 Round 1 Groundwater		4.5.6.3 Final Report	
1.12 Subcontractor (HC)		4.4.2 Round 2 Groundwater	X	4.6 Weekly Status Reports	
		4.4.3 Round 3 Groundwater		4.7 Weekly Management Reports	
		4.4.4 Round 4 Groundwater			

9613441.1484 E-93-06/2978-50

WESTINGHOUSE HANFORD COMPANY
300-FF-5 RI DATA VALIDATION
DISTRIBUTION FORM

Document Title: Sample Delivery Group — 9205L304-WES-421

Document Number: HCRL-WHC/9306-SD-92-002 Date: 11/13/92

		DISTRIBUTION			
M. Baker (HCRL)		D. Mantooth (ERL)		B. Ulbricht (ERL)	
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Y. Chun (HCSEA)		R. Potter (HCRL)		N. Wold (ERL)	
B. Downs (HCSEA)		K. Rolla (HCSEA)		Project File (HCRL)	
M. Gerboth (HCRL)		C. Russel (HCSEA)		Duplicate Project File (HCSEA)	X
J. Grover (ERL)		C. Sater (ERL)		Westinghouse EDMC	
L. Hammerle (HCSEA)		M. Schwartz (ERL)			
L. Hulstrom (WHC)		A. Shen (HCSEA)			

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1.4 Project Modifications				4.5.1 Round 1 Groundwater	
1.5.1 Staff Resumes		3.1 Task Order		4.5.1.1 Internal Drafts/Comments/Resol.	
1.5.2 Staff Training		3.2 Sample Lists		4.5.1.2 WHC Review Draft/Comments/Resol.	
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1.6.3.1 QA Audits-Deliverables				4.5.2.2 WHC Review Draft/Comments/Resol.	
1.6.3.2 QA Audits-Files		4.1 Task Plan		4.5.2.3 Final Report	
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1.6.5 Training		4.2.2 Checklists - Round 2 GW		4.5.3.2 WHC Review Draft/Comments/Resol.	
1.6.6.1 QA Manual Doc Log		4.2.3 Checklists - Round 3 GW		4.5.3.3 Final Report	
1.6.6.2 Procedures Doc Log		4.2.4 Checklists - Round 4 GW		4.5.4 Round 4 Groundwater	
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1.7.1 Downloads		4.3 Data Val. Calcs./Annotated DP		4.5.4.3 Final Report	
1.7.2 M-113s		4.3.1 Round 1 Groundwater		4.5.5 Biota/Small Mammals	
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1.7.4 Budget Status		4.3.3 Round 3 Groundwater		4.5.5.2 WHC Review Draft/Comments/Resol.	
1.7.5 Invoices		4.3.4 Round 4 Groundwater		4.5.5.3 Final Report	
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		4.4.3 Round 3 Groundwater		4.7 Weekly Management Reports	
		4.4.4 Round 4 Groundwater			

9613441.1485

HCRL - WHC/ 9 3 0 6 - T - 9 2 - 0 2 E-93-06/2978-50

WESTINGHOUSE HANFORD COMPANY
300-FF-5 RI DATA VALIDATION
DISTRIBUTION FORM

Document Title: Picture Gift Record – Letter Case # 92-[illegible]

Document Number: HCRL - WHC/ 9 3 0 6 - L - 9 2 - 0 4 5 Date: December, 1992

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Project Files (1=Adm; 2=Corres; 3=Source Information; 4=Technical Data & Products)

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1.6.6.3 Plans Document Log		4.2.5 Checklists - Biota/Small Mam.		4.5.4.1 Internal Drafts/Comments/Resol.	
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		4.4.4 Round 4 Groundwater			

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HARTCROWSER

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Earth and Environmental Technologies

2978-50

December 11, 1992

Mr. Larry Hulstrom
Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

Subject: WHC Order No. MLW-SVV-037106
Task Order No. E-93-06
Preliminary Quality Assurance Record - 300-FF-5 RI/FS
Weston Case Number 9205L304 - Volatile Organics

Dear Mr. Hulstrom:

Ebasco and Hart Crowser are pleased to provide you with the attached results of our review and validation of the subject data from the 300-FF-5 Operable Unit Remedial Investigation/Feasibility Study (RI/FS). The attached results are provided to you in partial fulfillment of Subtask 03 of our task plan dated November 6, 1992. The subject data package consisted of one low level water sample submitted for analysis for volatile organics. The samples were analyzed by Weston using the U.S. Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) statement of work. All analytical results, together with the data qualifiers which we have tentatively assigned as a result of our review, are provided in Attachment 4.

DATA QUALITY OBJECTIVES SUMMARY

Most data quality objectives (e.g. GC/MS tuning, surrogates, matrix spike/matrix spike duplicate, initial calibrations, contract required quantitation limits, compound identifications, and internal standards) were met for this case with the exception of the following: there were percent difference exceedences for some continuing calibration compounds and there was minor blank contamination.

MAJOR DEFICIENCIES (REJECTED DATA)

No data were rejected.

MINOR DEFICIENCIES (OTHER QUALIFIED DATA)

The following data qualifications have been noted. All qualified data are discussed in Attachments 3 and 5.

Results for three compounds (bromodichloromethane, 4-methyl-2-pentanone, and 1,1,2,2,-tetrachloroethane) for sample B062R3 were qualified as having estimated quantitation limits (UJ) due to percent difference exceedences of the associated continuing calibration.

Acetone results for sample B062R3 were qualified as undetected (U) at the quantitation limit due to blank contamination.

We trust that these preliminary results meet your needs. Our qualifier assignments will be finalized at the time the summary report for this sampling round is published. The final qualifiers may vary from those presented here, reflecting any trends in data quality or laboratory performance observed over the course of the 300-FF-5 RI/FS. Please contact me if you have any questions with regard to our activities.

Sincerely,

HART CROWSER, INC.
For D.M.G.

D. MARK GERBOTH, P.E.
Project Manager
HC#129:RL1498.DOC

Attachments

cc: Mark Gerboth (w/o attachments)
Jeff Grover (w/o attachments)
Westinghouse EDMC
Project File - HCRL-WHC/9306-L-92-048

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides copies of the as-received sample concentration reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary or copies of the annotated sample concentration reports as qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

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

NJ - Indicates presumptive evidence of a compound at an estimated value.

N - Indicates presumptive evidence of a compound.

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ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

Volatiles by GC/MS, HSL List

RFW Batch Number: 9205L304 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-01-0000

Report Date: 06/16/92 10:29

Page: 1a

	Cust ID:	BO62R3		BO62R3		BO62R3		VBLK											
Sample Information	RFW#:	001		001 MS		001 MSD		92LVR026-MB1											
	Matrix:	WATER		WATER		WATER		WATER											
	D.F.:	1.00		1.00		1.00		1.00											
	Units:	ug/L		ug/L		ug/L		ug/L											
	Toluene-d8	106	%	96	%	93	%	102	%										
Surrogate	Bromofluorobenzene	99	%	93	%	90	%	98	%										
Recovery	1,2-Dichloroethane-d4	101	%	110	%	108	%	106	%										
Chloromethane		10	U	10	U	10	U	10	U										
Bromomethane		10	U	10	U	10	U	10	U										
Vinyl Chloride		10	U	10	U	10	U	10	U										
Chloroethane		10	U	10	U	10	U	10	U										
Methylene Chloride		5	U	5	U	5	U	5	U										
Acetone		3	JB	3	JB	3	JB	5	J										
Carbon Disulfide		5	U	5	U	5	U	5	U										
1,1-Dichloroethene		5	U	86	%	95	%	5	U										
1,1-Dichloroethane		5	U	5	U	5	U	5	U										
1,2-Dichloroethene (total)		88		85		85		5	U										
Chloroform		5	U	5	U	5	U	5	U										
1,2-Dichloroethane		5	U	5	U	5	U	5	U										
2-Butanone		10	U	10	U	10	U	10	U										
1,1,1-Trichloroethane		5	U	5	U	5	U	5	U										
Carbon Tetrachloride		5	U	5	U	5	U	5	U										
Vinyl Acetate		10	U	10	U	10	U	10	U										
Bromodichloromethane		5	U	5	U	5	U	5	U										
1,2-Dichloropropane		5	U	5	U	5	U	5	U										
cis-1,3-Dichloropropene		5	U	5	U	5	U	5	U										
Trichloroethene		11		100	%	99	%	5	U										
Dibromochloromethane		5	U	5	U	5	U	5	U										
1,1,2-Trichloroethane		5	U	5	U	5	U	5	U										
Benzene		5	U	91	%	90	%	5	U										
Trans-1,3-Dichloropropene		5	U	5	U	5	U	5	U										
Bromoform		5	U	5	U	5	U	5	U										
4-Methyl-2-pentanone		10	U	10	U	10	U	10	U										
2-Hexanone		10	U	10	U	10	U	10	U										
Tetrachloroethene		5	U	5	U	5	U	5	U										
1,1,2,2-Tetrachloroethane		5	U	5	U	5	U	5	U										

*= Outside of EPA CLP QC limits.

9205L304.1991

Cust ID:	BO62R3	BO62R3	BO62R3	VBLK
RFW#:	001	001 MS	001 MSD	92LVR026-MB1
Toluene	5 U	80 %	80 %	5 U
Chlorobenzene	5 U	91 %	91 %	5 U
Ethylbenzene	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

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ATTACHMENT 3

Summary of Data Qualifications

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: 9205L304-WES-421	REVIEWER: LPH	DATE: 12/4/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bromodichloromethane	UJ	B062R3	cont. calibration out of limits
4-methyl-2-pentanone	UJ	B062R3	↓
1,1,2,2-Tetrachloroethane	UJ	B062R3	↓
Acetone	U	B062R3	sample conc. ≤ 10x blank conc.

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ATTACHMENT 4

As Qualified Data Summary

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VOLATILE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

B062R3

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-01-0000

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9205L304-001

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

Lab File ID: R051407

Level: (low/med) LOW

Date Received: 05/13/92

% Moisture: not dec. _____

Date Analyzed: 05/14/92

Column: (pack/cap) CAP

Dilution Factor: 1.00

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

CAS NO.	COMPOUND			
74-87-3	Chloromethane	10	U	
74-83-9	Bromomethane	10	U	
75-01-4	Vinyl Chloride	10	U	
75-00-3	Chloroethane	10	U	
75-09-2	Methylene Chloride	5	U	
67-64-1	Acetone	210	~~U~~	LPH 12/3/92
75-15-0	Carbon Disulfide	5	U	
75-35-4	1,1-Dichloroethene	5	U	
75-34-3	1,1-Dichloroethane	5	U	
540-59-0	1,2-Dichloroethene (total)	88		
67-66-3	Chloroform	5	U	
107-06-2	1,2-Dichloroethane	5	U	
78-93-3	2-Butanone	10	U	
71-55-6	1,1,1-Trichloroethane	5	U	
56-23-5	Carbon Tetrachloride	5	U	
108-05-4	Vinyl Acetate	10	U	
75-27-4	Bromodichloromethane	5	UJ	LPH 12/3/92
78-87-5	1,2-Dichloropropane	5	U	
10061-01-5	cis-1,3-Dichloropropene	5	U	
79-01-6	Trichloroethene	11		
124-48-1	Dibromochloromethane	5	U	
79-00-5	1,1,2-Trichloroethane	5	U	
71-43-2	Benzene	5	U	
10061-02-6	Trans-1,3-Dichloropropene	5	U	
75-25-2	Bromoform	5	U	
108-10-1	4-Methyl-2-pentanone	10	UJ	LPH 12/3/92
591-78-6	2-Hexanone	10	U	
127-18-4	Tetrachloroethene	5	U	
79-34-5	1,1,2,2-Tetrachloroethane	5	UJ	LPH 12/3/92
108-88-3	Toluene	5	U	
108-90-7	Chlorobenzene	5	U	
100-41-4	Ethylbenzene	5	U	
100-42-5	Styrene	5	U	
1330-20-7	Xylene (total)	5	U	

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VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B062R3,6,40MLGS

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-01-0000

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9205L304-001

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

Lab File ID: R051407

Level: (low/med) LOW

Date Received: 05/13/92

% Moisture: not dec. _____

Date Analyzed: 05/14/92

Column: (pack/cap) CAP

Dilution Factor: 1.00

Number TICs found: 0

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

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

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ATTACHMENT 4

As Qualified Data Summary

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ATTACHMENT 5

Data Review Supporting Documentation

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: 300-FF-5	REVIEWER: LPH	DATE: 12/3/92
LABORATORY: ROY F. WESTON INC.	CASE: 9205L304-	SDG:
SAMPLES/MATRIX: B062R3,	WES-421	

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	X		
Data Summary	X		
Chain-of-Custody	X		
QC Summary			
Surrogate report	X		
MS/MSD report	X		
Blank summary report	X		
GC/MS tuning report	X		
Internal standard summary report	X		
Sample Data			
Sample reports	X		
TIC reports for each sample	X		
RIC reports for all samples	X		
Raw and corrected spectra for all detected results	X		
Raw and corrected library search data for all reported TIC	X		
Quantitation and calculation data for all TIC	X		
Standards Data			
Initial calibration report	X		
RIC and quantitation reports for initial calibration	X		
Continuing calibration reports	X		
RIC and quantitation reports for cont. calibrations	X		
Internal standard summary report	X		
Raw QC Data			
Tuning report, spectra and mass lists	X		
Blank analysis reports	X		
TIC reports for all blanks	X		
RIC and quantitation reports for blanks	X		
Raw and corrected spectra for all detected results in blanks	X		
Raw and corrected library search data for all reported TIC	X		

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC	✓		
MS/MSD report forms	✓		
RIC and quantitation reports for MS/MSD	✓		
Additional Data			
Moisture/% solids data sheets		✓	
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets		✓	

2. HOLDING TIMES

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? (Yes) No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a bromofluorobenzene tune report present for each applicable 12-h period?	(Yes)	No	N/A
Do all tunes on all instruments meet the tuning criteria?	(Yes)	No	N/A
Do all tunes on all instruments meet the expanded criteria?	Yes	No	(N/A)
Has the laboratory made any calculation or transciption errors?	Yes	No	(N/A)
Have the proper significant figures been reported?	Yes	No	(N/A)

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for nondetects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments?	(Yes)	No	N/A
Are all RSD values ≤30% (2/88 SOW)?	(Yes)	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	(Yes)	No	N/A

Are all applicable RSD values ≤20.5% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for nondetects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12-h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for nondetects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12-h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results ≤10 time the highest blank concentration for the common laboratory contaminants, as nondetects (U) or at the SQL if the result is <CRQL. Qualify all remaining sample results ≤5 times the blank concentration in similar fashion.

4.2. FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results ≤ 5 times the amount in any valid field blank as nondetects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries < 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for nondetects) for surrogates out of specification but > 10%. Qualify all associated positive sample results as estimated (J) and all nondetect results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is > 5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

5.3 PERFORMANCE AUDIT SAMPLES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are >5xCRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for nondetects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard? Yes No N/A

Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra? Yes No N/A

Do the relative intensities between the standard and sample spectra agree within 20%? Yes No N/A

Have all ions > 10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination? Yes No N/A

Are molecular ions present in the reference specrum present in the sample spectrum? Yes No N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation? Yes No N/A

Are results and quantitation limits calculated properly? Yes ~~No~~ N/A

Has the laboratory reported the sample quantitation limits within 5xCRQL values? Yes No N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW? Yes No N/A

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

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as nondetects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as nondetects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW? Yes No N/A

Were project specific data quality objectives met for this analysis? Yes No N/A

ACTION: Summarize all the data qualifications recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

HOLDING TIME SUMMARY - FORM B-1

SDG: 9205L30A WES-421	REVIEWER: LPH	DATE: 12/3/92	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
B0762R3	VOA	5/11/92		5/14/92		3	NONE

CALIBRATION DATA SUMMARY - FORM B-2

SDG: 9205L304-WES-421	REVIEWER: LPH	DATE: 12/3/92	PAGE 1 OF 1		
COMMENTS:					
CALIB. TYPE:	INITIAL CONTINUING	INSTRUMENT:			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
5/7/92	INITIAL CAL	OK	OK		
cont. 5/14/92	Bromodichloromethane		%D= 55.5	B1026 2-3	UJ
	4-methyl-2-pentanone		%D= 29.8	↓	UJ
	1,1,2,2-Tetrachloroethane		%D= 28.0	↓	UJ

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BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: 9205L304-WES-421	REVIEWER: LDH	DATE: 12/4/92	PAGE 1 OF 1

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
~~B062R3~~	~~Bromodichloromethane~~	~~5~~	~~U~~						~~UJ~~
	~~4-Methyl-2-pentanone~~	~~10~~	~~U~~						~~UJ~~
	~~1,1,2,2-Tetrachloroethane~~	~~5~~	~~U~~						~~UJ~~
VBLK	Acetone	5	J			25	50	B062R3	U

LDH

ACCURACY DATA SUMMARY - FORM B-4

SDG: 92051304 - WES-421	REVIEWER: LPH	DATE: 12/4/92	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
Surrogates		OK		
MS Recovery		OK		

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CALCULATION SUMMARY - FORM B-6

SDG: 9206L301-WES-221	REVIEWER: LPH	DATE: 12/7/93	PAGE 1 OF 1

COMMENTS:

SECTION 8.2 : Compound Identification

SAMPLE B062R3 → Acetone: 5146 x 50 / 134360 x 0.687 = 2.79

1,2-Dichloroethene - 2240 x 50 / 134360 x 1.84 = 0.45

Trichloroethane - 49509 x 50 / 564449 x 0.397 = 11.0

Cis-1,2-Dichloroethene - 519441 x 50 / 134360 x 1.84 = 105

Cis-1,2-Dichloroethene 519441 x 50 / 134360 x 2.20 = 87.9

9613441.1513

HARTCROWSER

Hart Crowser, Inc.
1201 Jadwin Avenue, Suite 204
Richland, WA 99352
FAX 509.946.4203
509.946.4344

Earth and Environmental Technologies

APR 1993
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OSM DMO

J-2978-50

April 16, 1993

Ms. Jeanette Duncan
Westinghouse Hanford Company
P.O. Box 1970 MSIN H4-23
Richland, Washington 99352

Re: WHC Order No. MLW-SVV-037106
Task Order Nos. E-93-06
Final Quality Assurance Records for 300-FF-5 RI Samples

Dear Ms. Duncan:

Enclosed please find the Final Quality Assurance Records (FQARs) for the 300-FF-5 Operable Unit Remedial Investigations (RI) data packages noted in the attachment to this letter. The FQARs include copies of the annotated and amended laboratory data summary reports (Form 1), and relevant supporting documentation. A complete discussion of our data qualifier assignments is provided in the Data Validation and Qualifier Summary Reports published for each 300-FF-5 RI sampling round. Please contact me if you have any questions with regard to the materials being returned to you.

Sincerely,

HART CROWSER, INC.

D. MARK GERBOTH, P.E.
Task Manager
HCR9408L174.DOC

cc: L. Hulstrom, Westinghouse Hanford
300-FF-5 Project File (HRCL-WHC/9306-L-93-095)

Attachment - Data Returned to Westinghouse Hanford, April 16, 1993

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Hart Crowser
J-2978-50

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APPENDIX A
DATA VALIDATION DOCUMENTATION

Roy F. Weston Laboratories

Data Package 9205L304

Volatile Organic Analyses

THIS APPENDIX CONSISTS OF FIVE ATTACHMENTS

Attachment 1 - Glossary of Data Qualifiers

This attachment provides a glossary explaining all data qualifiers applied as a result of the validation.

Attachment 2 - As Received Laboratory Sample Concentration Reports

This attachment provides copies of the as-received sample concentration reports.

Attachment 3 - Summary of Data Qualifications

This attachment provides a complete summary of all qualifications applied as a result of the validation.

Attachment 4 - As Qualified Data Summary

This attachment provides a tabular data summary or copies of the annotated sample concentration reports as qualified from the validation.

Attachment 5 - Data Review Supporting Documentation

This attachment provides copies of the data validation checklists, data summary forms, telephone contact memoranda and other documentation completed as a result of the data validation.

ATTACHMENT 1

Glossary of Data Qualifiers

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

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to quality control deficiencies identified during data validation the value reported may not accurately reflect the sample quantitation limit.

J - Indicates the compound or analyte was analyzed for and detected. The associated value is estimated but the data are useable for decision making processes.

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

NJ - Indicates presumptive evidence of a compound at an estimated value.

N - Indicates presumptive evidence of a compound.

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ATTACHMENT 2

As Received Laboratory Sample Concentration Reports

RFW Batch Number: 9205L304 Client: WESTINGHOUSE HANFORD

	Cust ID:	BO62R3	BO62R3	BO62R3	VBLK
Sample Information	RFW#:	001	001 MS	001 MSD	92LVR026-MB1
	Matrix:	WATER	WATER	WATER	WATER
	D.F.:	1.00	1.00	1.00	1.00
	Units:	ug/L	ug/L	ug/L	ug/L
Surrogate Recovery	Toluene-d8	106 %	96 %	93 %	102 %
	Bromofluorobenzene	99 %	93 %	90 %	98 %
	1,2-Dichloroethane-d4	101 %	110 %	108 %	106 %
Chloromethane		10 U	10 U	10 U	10 U
Bromomethane		10 U	10 U	10 U	10 U
Vinyl Chloride		10 U	10 U	10 U	10 U
Chloroethane		10 U	10 U	10 U	10 U
Methylene Chloride		5 U	5 U	5 U	5 U
Acetone		3 JB	3 JB	3 JB	5 J
Carbon Disulfide		5 U	5 U	5 U	5 U
1,1-Dichloroethene		5 U	86 %	95 %	5 U
1,1-Dichloroethane		5 U	5 U	5 U	5 U
1,2-Dichloroethene (total)		88	85	85	5 U
Chloroform		5 U	5 U	5 U	5 U
1,2-Dichloroethane		5 U	5 U	5 U	5 U
2-Butanone		10 U	10 U	10 U	10 U
1,1,1-Trichloroethane		5 U	5 U	5 U	5 U
Carbon Tetrachloride		5 U	5 U	5 U	5 U
Vinyl Acetate		10 U	10 U	10 U	10 U
Bromodichloromethane		5 U	5 U	5 U	5 U
1,2-Dichloropropane		5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene		5 U	5 U	5 U	5 U
Trichloroethene		11	100 %	99 %	5 U
Dibromochloromethane		5 U	5 U	5 U	5 U
1,1,2-Trichloroethane		5 U	5 U	5 U	5 U
Benzene		5 U	91 %	90 %	5 U
Trans-1,3-Dichloropropene		5 U	5 U	5 U	5 U
Bromoform		5 U	5 U	5 U	5 U
4-Methyl-2-pentanone		10 U	10 U	10 U	10 U
2-Hexanone		10 U	10 U	10 U	10 U
Tetrachloroethene		5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane		5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

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Cust ID:	BO62R3	BO62R3	BO62R3	VBLK
RFW#:	001	001 MS	001 MSD	92LVR026-MB1
Toluene	5 U	80 %	80 %	5 U
Chlorobenzene	5 U	91 %	91 %	5 U
Ethylbenzene	5 U	5 U	5 U	5 U
Styrene	5 U	5 U	5 U	5 U
Xylene (total)	5 U	5 U	5 U	5 U

*= Outside of EPA CLP QC limits.

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ATTACHMENT 3

Summary of Data Qualifications

Appendix (A)

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: 9205L304-WES-421	REVIEWER: LPH	DATE: 12/4/92	PAGE 1 OF 1
COMMENTS:			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Bromodichloromethane	UJ	B062R3	cont. calibration out of limits
4-methyl-2-pentanone	UJ	B062R3	
1,1,2,2-Tetrachloroethane	UJ	B062R3	
Acetone	U	B062R3	sample conc. ≤ 10x blank conc.

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ATTACHMENT 4

As Qualified Data Summary

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Appendix (A)

1A

VOLATILE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

B062R3

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-01-0000

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9205L304-001

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

Lab File ID: R051407

Level: (low/med) LOW

Date Received: 05/13/92

% Moisture: not dec. _____

Date Analyzed: 05/14/92

Column: (pack/cap) CAP

Dilution Factor: 1.00

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

CAS NO.	COMPOUND		
74-87-3	Chloromethane	10	U
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	5	U
67-64-1	Acetone	~~3~~ 10	~~B~~ U LPH 12/3/92
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	88	
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	UJ LPH 12/3/92
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	11	
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-pentanone	10	UJ LPH 12/3/92
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	UJ LPH 12/3/92
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

FORM 1 V-1

12/88 Rev.

✓ cmc

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VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

B062R3,6,40MLGS

Lab Name: Roy F. Weston, Inc. Work Order: 6168-02-01-0000

Client: WESTINGHOUSE HANFORD

Matrix: WATER

Lab Sample ID: 9205L304-001

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

Lab File ID: R051407

Level: (low/med) LOW

Date Received: 05/13/92

% Moisture: not dec. _____

Date Analyzed: 05/14/92

Column: (pack/cap) CAP

Dilution Factor: 1.00

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 12/88 Rev.

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ATTACHMENT 5

Data Review Supporting Documentation

Appendix (A)

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: 300-FF-5	REVIEWER: LPH	DATE: 12/3/92
LABORATORY: ROY F. WESTON INC.	CASE: 9205L304-	SDG:
SAMPLES/MATRIX: B062R3,	WES-421	

1. DATA PACKAGE COMPLETENESS

Review the data package for completeness and check off the items below. If any data review elements are missing contact the laboratory for submittal.

Data Package Item	Present?: Yes	No	N/A
Case Narrative	X		
Data Summary	X		
Chain-of-Custody	X		
QC Summary			
Surrogate report	X		
MS/MSD report	X		
Blank summary report	X		
GC/MS tuning report	X		
Internal standard summary report	X		
Sample Data			
Sample reports	X		
TIC reports for each sample	X		
RIC reports for all samples	X		
Raw and corrected spectra for all detected results	X		
Raw and corrected library search data for all reported TIC	X		
Quantitation and calculation data for all TIC	X		
Standards Data			
Initial calibration report	X		
RIC and quantitation reports for initial calibration	X		
Continuing calibration reports	X		
RIC and quantitation reports for cont. calibrations	X		
Internal standard summary report	X		
Raw QC Data			
Tuning report, spectra and mass lists	X		
Blank analysis reports	X		
TIC reports for all blanks	X		
RIC and quantitation reports for blanks	X		
Raw and corrected spectra for all detected results in blanks	X		
Raw and corrected library search data for all reported TIC	X		

Appendix (A)

Data Package Item	Present?: Yes	No	N/A
Quantitation and calculation data for all TIC	✓	—	—
MS/MSD report forms	✓	—	—
RIC and quantitation reports for MS/MSD	✓	—	—
Additional Data			
Moisture/% solids data sheets	—	✓	—
Reduction formulae	—	✓	—
Instrument time logs	—	✓	—
Chemist notebook pages	—	✓	—
Sample preparation sheets	—	✓	—

2. HOLDING TIMES

Complete the holding time summary form listing all samples and dates of collection and analysis.

Were all samples analyzed within holding time? (Yes) No N/A

ACTION: If any holding times were exceeded, but not by greater than a factor of two, qualify associated samples as estimated (J for detects or UJ for nondetects), otherwise reject all nondetects (R) and qualify all associated detects as estimated (J).

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

Is a bromofluorobenzene tune report present for each applicable 12-h period? (Yes) No N/A

Do all tunes on all instruments meet the tuning criteria? (Yes) No N/A

Do all tunes on all instruments meet the expanded criteria? Yes No (N/A)

Has the laboratory made any calculation or transciption errors? Yes No (N/A)

Have the proper significant figures been reported? Yes No (N/A)

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects or UJ for nondetects). If all tuning criteria are missed, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments? (Yes) No N/A

Are all RSD values ≤30% (2/88 SOW)? (Yes) No N/A

Are all RRF values ≥0.05 (2/88 SOW)? (Yes) No N/A

Are all applicable RSD values ≤20.5% (3/90 SOW)?	Yes	No	N/A
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all applicable RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all detected results for the particular compound as estimated (J) and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any RSD value is out of specification qualify all associated data as estimated (J for detects or UJ for nondetects).

3.3. CONTINUING CALIBRATION

Is a continuing calibration report present for all 12-h periods in which associated samples were analyzed?	Yes	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	Yes	No	N/A
Are all %D values ≤25% (2/88 or 3/90 SOW)?	Yes	No	N/A
Are all %D values ≤40% (3/90 SOW)?	Yes	No	N/A
Are all RRF values within SOW limits (3/90 SOW)?	Yes	No	N/A
Are all erratic performance compound RRF values ≥0.01 (3/90 SOW)?	Yes	No	N/A

ACTION: With the exception of compounds that exhibit erratic performance and making allowances for up to two TCL compounds, if any RRF value is out of specification qualify all associated detected results as estimated and all nondetects as unusable (R). Making allowances for up to two TCL compounds, if any %D is out of specification, qualify all associated results as estimated (J for detects or UJ for nondetects).

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every 12-h period in which samples were analyzed?	Yes	No	N/A
Are TCL compounds present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all sample results ≤10 time the highest blank concentration for the common laboratory contaminants, as nondetects (U) or at the SQL if the result is <CRQL. Qualify all remaining sample results ≤5 times the blank concentration in similar fashion.

4.2. FIELD BLANKS

Are TCL compounds present in the field blanks? Yes No N/A

ACTION: Qualify all detected sample results ≤ 5 times the amount in any valid field blank as nondetects (U) and note the field blank results in the validation narrative.

5. ACCURACY

5.1 SURROGATE/SYSTEM MONITORING COMPOUND RECOVERY

Are any surrogate recoveries out of specification? Yes No N/A

Are any surrogate recoveries < 10%? Yes No N/A

Are any method blank surrogate recoveries out of specification? Yes No N/A

ACTION: Qualify all associated sample results as estimated (J for detects or UJ for nondetects) for surrogates out of specification but > 10%. Qualify all associated positive sample results as estimated (J) and all nondetect results as unusable (R) for all surrogates below 10%. If method blank surrogates are out of specification and the associated sample surrogates are acceptable no qualification is necessary, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has an MS/MSD analysis been conducted per matrix in the sample group? Yes No N/A

Are MS/MSD recoveries within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: If an MS/MSD analysis has not been conducted contact the laboratory for an explanation. Review the MS/MSD recoveries in conjunction with other QC data such as surrogate recoveries and note the results in the validation narrative. If MS/MSD recoveries are out of specification and sample concentration is > 5 times the spike concentration, no qualification is required, otherwise qualify results as follows: Qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J) in all samples if associated surrogates are also out of specification. The qualification shall only be done on samples of similar matrix as the MS/MSD samples. If it is determined from the review that only the spiked samples are affected by low recoveries, qualify only the results for the spiked sample as described above. If it is determined from the review that out of specification MS/MSD recoveries are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

Appendix (A)

5.3 PERFORMANCE AUDIT SAMPLES

Are the performance audit sample results within the acceptance limits? Yes No N/A

ACTION: Note the results of the performance audit sample in the validation narrative.

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

ACTION: Review the MS/MSD results in conjunction with other QC data such as field duplicates and note the results in the validation narrative. If MS/MSD RPDs are out of specification and sample results are > 5xCRQL qualify positive results for the specific class of compound (aromatics and non-aromatics) as estimated (J). If it is determined from the review that out of specification MS/MSD results are indicative of systematic problems in the laboratory such as sample preparation or sample-specific matrix interferences this must be noted in the validation narrative along with the potential affect on the sample results.

6.2 FIELD DUPLICATE SAMPLES

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

ACTION: Note the results of the field duplicate samples in the validation narrative.

6.3 FIELD SPLIT SAMPLES

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

ACTION: Note the results of the field split samples in the validation narrative.

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

Are any internal standard area counts outside the acceptance limits? Yes No N/A

Are retention times for any internal standard outside the ±30 second windows established by the most recent calibration check? Yes No N/A

ACTION: If the area counts are outside the acceptance limits qualify all associated results as estimated (J for detects or UJ for nondetects). If it is determined from the review that out of specification area counts and relative retention times are indicative of systematic problems within the laboratory the reviewer may consider rejection of all affected sample data (R).

Appendix (A)

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard? Yes No N/A

Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra? Yes No N/A

Do the relative intensities between the standard and sample spectra agree within 20%? Yes No N/A

Have all ions > 10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination? Yes No N/A

Are molecular ions present in the reference specrum present in the sample spectrum? Yes No N/A

ACTION: If compound identification is in error and retention time and mass spectral criteria are exceeded qualify all affected positive results as unusable (R). If cross-contamination between analyses is suspected, qualify affected data as unusable (R). Note the results in the validation narrative.

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standard(s) for quantitation? Yes No N/A

Are results and quantitation limits calculated properly? Yes ~~No~~ N/A

Has the laboratory reported the sample quantitation limits within 5xCRQL values? Yes No N/A

ACTION: If the results and quantitation limits are in error contact the laboratory for clarification and note in the validation narrative.

8.3 TENTATIVELY IDENTIFIED COMPOUNDS (TIC)

Has the laboratory conducted a spectral library search on all candidate TIC peaks in accordance with the analytical SOW? Yes No N/A

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

ACTION: If the laboratory has failed to search the minimum number of TIC peaks in the chromatogram contact the laboratory for submittal of the required data. Qualify as nondetects (U) all TIC compounds present in samples and blanks using the review criteria specified in the validation requirements. If TIC identification is in error sample results should be qualified as nondetects (U) or unusable (R). If TIC identifications are judged valid, qualify the results as presumptive and estimated (JN).

9. OVERALL ASSESSMENT AND SUMMARY

Has the laboratory conducted the analysis in accordance with the analytical SOW?	(Yes)	No	N/A
Were project specific data quality objectives met for this analysis?	(Yes)	No	N/A

ACTION: Summarize all the data qualifications recommended in the foregoing sections, and complete the data validation narrative according to the requirements of Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

Appendix (A)

HOLDING TIME SUMMARY - FORM B-1

SDG: 9205L30A WES-421	REVIEWER: LPH	DATE: 12/3/92	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
B0762R3	VOA	5/11/92	NA	5/14/92	NA	3	NONE

✓ UMC

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Appendix (A)

CALIBRATION DATA SUMMARY - FORM B-2

SDG: 92056304-WES-421	REVIEWER: LPH	DATE: 12/3/92	PAGE 1 OF 1		
COMMENTS:					
CALIB. TYPE: INITIAL CONTINUING		INSTRUMENT: 5100R			
CALIB. DATE	COMPOUND	RF	RSD/%D/%R	SAMPLES AFFECTED	QUALIFIER
5/7/92	INITIAL CAL	OK	OK		
cont. 5/14/92	Bromodichloromethane ✓		%D = 55.5	B0762R3	UJ
	4-methyl-2-pentanone ✓		%D = 29.8	↓	UJ
	1,1,2,2-Tetrachloroethane ✓		%D = 28.0	↓	UJ
Tunes					
5/7/92	15:23 → all OK → ICAL				
5/14/92	11:42 → all OK → CCV, blank, B0762R3, MS+MSD				

✓ CMR

9613441.1535

Appendix (A)

BLANK AND SAMPLE DATA SUMMARY - FORM B-3

SDG: 9205L304-WES-421	REVIEWER: LDA	DATE: 12/4/92	PAGE 1 OF 1

COMMENTS:

SAMPLE ID	COMPOUND	RESULT	Q	RT	UNITS	5X RESULT	10X RESULT	SAMPLES AFFECTED	QUALIFIER
~~8062R3~~	~~Bromodichloromethane~~	~~5~~	~~U~~						~~UJ~~
	~~4-methyl-2-pentanone~~	~~10~~	~~U~~						~~UJ~~
	~~1,1,2,2-Tetrachloroethane~~	~~5~~	~~U~~						~~UJ~~
VBLK	Acetone	5	J			25	~~50~~	8062R3	UL

LDA

B-3

9613441.1536

WHC-SD-EN-SPP-002, Rev. 1

Appendix (A)

ACCURACY DATA SUMMARY - FORM B-4

SDG: 9205L304-WES-421	REVIEWER: LPH	DATE: 12/4/92	PAGE 1 OF 1	
COMMENTS:				
SAMPLE ID	COMPOUND	% RECOVERY	SAMPLE(S) AFFECTED	QUALIFIER REQUIRED
surrogates		OK (99-106%)		none
ms Recovery (used sample B062R3)		OK (80-100%)		none
internal stds		ok		none

9613441.1537

WHC-SD-EN-SPP-002, Rev. 1

Appendix (A)

PRECISION DATA SUMMARY - FORM B-5

9205L304

SDG:	REVIEWER CMRussell	DATE:	PAGE 1 OF 1
COMMENTS: Volatiles			

COMPOUND	SAMPLE ID:	SAMPLE ID:	RPD	SAMPLES AFFECTED	QUALIFIER
MS Dup → all acceptable					none
(range 0-10% RPD)					

9613441.1538

Appendix (A)

CALCULATION SUMMARY - FORM B-6

SDG: 42061301-WES-421	REVIEWER: LPH	DATE: 12/4/92	PAGE 1 OF 1

COMMENTS:

SECTION 8.2 : Compound Identification

SAMPLE B062R3 → Acetone: 5146 x 50 / 134360 x 0.687 = 2.79

1,2-Dichloroethene - 2240 x 50 / 134360 x 1.84 = 0.49

Trichloroethane - 49509 x 50 / 564449 x 0.397 = 11.0

Cis-1,2-Dichloroethene - 519441 x 50 / 134360 x 1.84 = 105

Cis,1,2-Dichloroethene 519441 x 50 / 134360 x 2.20 = 87.9