Westinghouse Hanford Company

START

CHAIN OF CUSTODY

0043037

9107L114-WES-109

Custody Form Initiator WENDY S. THOMPSON

Project #: 91-019

Company Contact Wendy S. Thompson

Telephone (509) 376-2153

Project Designation/Sampling Locations 200-BP-1 Operable Unit

Collection Date 7/8/91

Boring: 216-B-57 A

TIME 1254

Ice Chest No. RM#25

Field Logbook No. WHC-N-287-3

Bill of Lading/Airbill No. 24 7425 0240

Offsite Property No. W91-0214-44

Method of Shipment Air

Shipped to Weston Laboratory, 208 Welsh Pool Rd., Lionville, PA 19341-1313

Possible Sample Hazards/Remarks See statement of work for 200-BP-1 RI/FS.

Sample Identification

(1) B00X59

1, 125ml., amber glass; soil; CLP-VOA

1, 950ml.; amber glass; soil; CLP- Semi-VOA; Pest/PCB; TOC; metals; Br; Cn; Anions

1, 1000ml.; glass; soil; CLP- Radionuclides

N/A

N/A

☐ Field Transfer of Custody

CHAIN OF POSSESSION

(Sign and Print Names)

Relinquished by:	Received by:	Date/Time:
Wendy S. Thompson Wendy S. Thompson	J. Demarest J. Demarest	7-9-91 1345
J. DEMAREST J. Demarest		

FEB 1996 RECEIVED

Final Sample Disposition

Disposal Method:	Disposed by:	Date/Time:

Comments:

A-6000-437 (12/90)

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

RFW Batch Number: 9107L114 | Client: WESTINGHOUSE HANFORD | Work Order: 6168-02-01-0000 | Report Date: 07/18/91 11:53 | Page: 1a

	Cust ID:	BOOX59		VBLK	
Sample Information	RFW#:	001		91LVY131-MB1	
	Matrix:	SOIL		SOIL	
	D.F.:	0.980		1.00	
	Units:	ug/Kg		ug/Kg	
Surrogate Recovery	Toluene-d8	100	%	101	%
	Bromofluorobenzene	103	%	102	%
	1,2-Dichloroethane-d4	92	%	92	%
Chloromethane		10	U	10	U
Bromomethane		10	U	10	U
Vinyl Chloride		10	U	10	U
Chloroethane		10	U	10	U
Methylene Chloride		16	B	5	
Acetone		31	B	10	
Carbon Disulfide		5	U	5	U
1,1-Dichloroethene		5	U	5	U
1,1-Dichloroethane		5	U	5	U
1,2-Dichloroethene (total)		5	U	5	U
Chloroform		5	U	5	U
1,2-Dichloroethane		5	U	5	U
2-Butanone		10	U	10	U
1,1,1-Trichloroethane		5	U	5	U
Carbon Tetrachloride		5	U	5	U
Vinyl Acetate		10	U	10	U
Bromodichloromethane		5	U	5	U
1,2-Dichloropropane		5	U	5	U
cis-1,3-Dichloropropene		5	U	5	U
Trichloroethene		5	U	5	U
Dibromochloromethane		5	U	5	U
1,1,2-Trichloroethane		5	U	5	U
Benzene		5	U	5	U
Trans-1,3-Dichloropropene		5	U	5	U
Bromoform		5	U	5	U
4-Methyl-2-pentanone		10	U	10	U
2-Hexanone		10	U	10	U
Tetrachloroethene		5	U	5	U
1,1,2,2-Tetrachloroethane		5	U	5	U

*= Outside of EPA CLP QC limits.

000005

9613402.1362

Cust ID:	BOOX59		VBLK	
RFW#:	001		91LVY131-MB1	
Toluene	5	U	5	U
Chlorobenzene	5	U	5	U
Ethylbenzene	5	U	5	U
Styrene	5	U	5	U
Xylene (total)	5	U	5	U

*= Outside of EPA CLP QC limits.

0000006

9613402.1363

WESTON

ROY F. WESTON, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 07-10-91
RFW #: 9107L114, GC/MS VOLATILE
W.O. #: 6168-02-01

NARRATIVE

One (1) soil sample was collected on 07-08-91.

The sample and its associated QC samples were analyzed according to criteria set forth in CLP SOW 2/88 (rev 5/89) for TCL Volatile target compounds on 07-11-91.

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

1. Non-target compounds were not detected in these samples.

2. All surrogate recoveries were within EPA QC limits.

3. Matrix spike and spike duplicate samples are associated with RFW lot 9107L094.

4. The laboratory blank contained the common contaminants methylene chloride and acetone at levels less than 2x the CRQL.

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

8.5.91.

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

9613402.1365 1A 0000017 CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS SHEET

BOOX59

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL

Lab Sample ID: 9107L114-001

Sample wt/vol: 5.10 (g/mL) G

Lab File ID: Y071105

Level: (low/med) LOW

Date Received: 07/10/91

% Moisture: not dec. 3

Date Analyzed: 07/11/91

Column: (pack/cap) PACK

Dilution Factor: 0.980

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

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	16	B
67-64-1	Acetone	31	B
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

9413402.1366

0000018 CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

BOOX59

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL

Lab Sample ID: 9107L114-001

Sample wt/vol: 5.10 (g/mL) G

Lab File ID: Y071105

Level: (low/med) LOW

Date Received: 07/10/91

% Moisture: not dec. 3

Date Analyzed: 07/11/91

Column: (pack/cap) PACK

Dilution Factor: 0.980

Number TICs found: 0

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

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

Custody Transfer Record/Lab Work Request

WESTON

WESTON Analytics Use Only
91074114

WS-Hanford Project #: 91-019

RM#25

Client: Westinghouse Hanford Co. 6116-03-01

Work Order: EE3E5 W. S. Thompson 5/14/91

Date Rec'd.: 7/10/91 Date Due: As specified in SOW

RFW Contact: Peg Beaty

Client Contact/Phone: W.S.Thompson (509)376-2153

Refrigerator#	Polycooler								
#/Type Container	← GLASS →								
Volume	125	950	1000 mL						
Preservative	← 4°C →								
ANALYSES REQUESTED →	VOA 1	BNA 2	ISOB 3	P/PCB	TOC	Metals	CN	Anions	
WA Use Only Lab ID / Client ID/Description / Matrix / Date Collected	0624H	0625H	1503	0603H	DCT	MBETR	IC1170	See Below	
001 B00X59 / Soil / 7/8/91	X	X	X	✓	✓	✓	✓	✓	

Revision #1 Radiochem published to Tele Lyne

QC/Del = CLP
TAT = 35 day

Anions = IC002, IC003
Metals = HSL + BT

ANALYSES REQUESTED

1. VOA (CLP)
2. Semi-VOA, Pesticides, PCB's, TOC, ICP/AA metals, Bismuth, Cyanide (CLP); IC Anions NO2/NO3
3. Total alpha/beta, GEA, Sr-90, Cs-137, Co-60, Pu-238, Pu 239/240, Ru-106, Total Uranium

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

Special Instructions:
Please call to confirm receipt and condition of sample

Item/Reason	Relinquished by	Received by	Date	Time	Item/Reason	Relinquished by	Received by	Date	Time
	Emery Pleigh		7/10/91	1:30 pm					
		SEE WHC C OF C							

WESTON Analytics Use Only

Samples Were:
1 Shipped or Hand-Delivered
NOTES:

2 Ambient or Chilled
NOTES:

3 Received Broken/Leaking (Improperly Sealed) Y N
NOTES:

4 Properly Preserved Y N
NOTES:

5 Received Within Holding Times Y N
NOTES:

COC Tape Was:
1 Present on Outer Package Y N
2 Unbroken on Outer Package Y N
3 Present on Sample Y N
4 Unbroken on Sample Y N
NOTES:

COC Record Was:
1 Present Upon Receipt of Samples Y N

Discrepancies Between Sample Labels and COC Record? Y N
NOTES:

9613402.1367 0000002

RFW 21-21-001/A-12/88

7-115

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

RFW Batch Number: 9107L114 Client: WESTINGHOUSE HANFORD Work Order: 6168-02-01-0000 Report Date: 08/08/91 00:31 Page: 1a

	Cust ID:	BOOX59		BOOX59		BOOX59		SBLK		SBLK RE		SBLK BS	
Sample Information	RFW#:	001		001 MS		001 MSD		91LE0886-MB1		91LE0886-MB1		91LE0886-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		1.00		1.00		1.00		1.00		1.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate Recovery	Nitrobenzene-d5	88	%	93	%	100	%	84	%	96	%	94	%
	2-Fluorobiphenyl	94	%	90	%	99	%	86	%	104	%	98	%
	p-Terphenyl-d14	99	%	93	%	99	%	74	%	129	%	90	%
	Phenol-d5	81	%	88	%	89	%	77	%	87	%	89	%
	2-Fluorophenol	85	%	80	%	89	%	81	%	81	%	87	%
	2,4,6-Tribromophenol	93	%	92	%	95	%	73	%	64	%	93	%
Phenol		350	U	78	%	81	%	330	U	330	U	84	%
bis(2-Chloroethyl)ether		350	U	340	U	340	U	330	U	330	U	330	U
2-Chlorophenol		350	U	89	%	94	%	330	U	330	U	91	%
1,3-Dichlorobenzene		350	U	340	U	340	U	330	U	330	U	330	U
1,4-Dichlorobenzene		350	U	81	%	85	%	330	U	330	U	82	%
Benzyl alcohol		350	U	340	U	340	U	330	U	330	U	330	U
1,2-Dichlorobenzene		350	U	340	U	340	U	330	U	330	U	330	U
2-Methylphenol		350	U	340	U	340	U	330	U	330	U	330	U
bis(2-Chloroisopropyl)ether		350	U	340	U	340	U	330	U	330	U	330	U
4-Methylphenol		350	U	340	U	340	U	330	U	330	U	330	U
N-Nitroso-Di-n-propylamine		350	U	73	%	78	%	330	U	330	U	81	%
Hexachloroethane		350	U	340	U	340	U	330	U	330	U	330	U
Nitrobenzene		350	U	340	U	340	U	330	U	330	U	330	U
Isophorone		350	U	340	U	340	U	330	U	330	U	330	U
2-Nitrophenol		350	U	340	U	340	U	330	U	330	U	330	U
2,4-Dimethylphenol		350	U	340	U	340	U	330	U	330	U	330	U
Benzoic acid		1700	U	1700	U	1700	U	1700	U	1700	U	1700	U
bis(2-Chloroethoxy)methane		350	U	340	U	340	U	330	U	330	U	330	U
2,4-Dichlorophenol		350	U	340	U	340	U	330	U	330	U	330	U
1,2,4-Trichlorobenzene		350	U	86	%	92	%	330	U	330	U	90	%
Naphthalene		350	U	340	U	340	U	330	U	330	U	330	U
4-Chloroaniline		350	U	340	U	340	U	330	U	330	U	330	U
Hexachlorobutadiene		350	U	340	U	340	U	330	U	330	U	330	U
4-Chloro-3-methylphenol		350	U	91	%	95	%	330	U	330	U	94	%
2-Methylnaphthalene		350	U	340	U	340	U	330	U	330	U	330	U
Hexachlorocyclopentadiene		350	U	340	U	340	U	330	U	330	U	330	U

*= Outside of EPA CLP QC limits.

9613402.1368 0000004

Cust ID:	BOOX59		BOOX59		BOOX59		SBLK		SBLK RE		SBLK BS	
RFW#:	001		001 MS		001 MSD		91LE0886-MB1		91LE0886-MB1		91LE0886-MB1	
2,4,6-Trichlorophenol	350	U	340	U	340	U	330	U	330	U	330	U
2,4,5-Trichlorophenol	1700	U	1700	U	1700	U	1700	U	1700	U	1700	U
2-Chloronaphthalene	350	U	340	U	340	U	330	U	330	U	330	U
2-Nitroaniline	1700	U	1700	U	1700	U	1700	U	1700	U	1700	U
Dimethylphthalate	350	U	340	U	340	U	330	U	330	U	330	U
Acenaphthylene	350	U	340	U	340	U	330	U	330	U	330	U
2,6-Dinitrotoluene	350	U	340	U	340	U	330	U	330	U	330	U
3-Nitroaniline	1700	U	1700	U	1700	U	1700	U	1700	U	1700	U
Acenaphthene	350	U	88	%	94	%	330	U	330	U	96	%
2,4-Dinitrophenol	1700	U	1700	U	1700	U	1700	U	1700	U	1700	U
4-Nitrophenol	1700	U	93	%	104	%	1700	U	1700	U	105	%
Dibenzofuran	350	U	340	U	340	U	330	U	330	U	330	U
2,4-Dinitrotoluene	350	U	87	%	95 *	%	330	U	330	U	95 *	%
Diethylphthalate	350	U	340	U	340	U	330	U	330	U	330	U
4-Chlorophenyl-phenylether	350	U	340	U	340	U	330	U	330	U	330	U
Fluorene	350	U	340	U	340	U	330	U	330	U	330	U
4-Nitroaniline	1700	U	1700	U	1700	U	1700	U	1700	U	1700	U
4,6-Dinitro-2-methylphenol	1700	U	1700	U	1700	U	1700	U	1700	U	1700	U
N-Nitrosodiphenylamine (1)	350	U	340	U	340	U	330	U	330	U	330	U
4-Bromophenyl-phenylether	350	U	340	U	340	U	330	U	330	U	330	U
Hexachlorobenzene	350	U	340	U	340	U	330	U	330	U	330	U
Pentachlorophenol	1700	U	111 *	%	117 *	%	1700	U	1700	U	114 *	%
Phenanthrene	350	U	340	U	340	U	330	U	330	U	330	U
Anthracene	350	U	340	U	340	U	330	U	330	U	330	U
Di-n-Butylphthalate	2300	B	2100	B	2300	B	39	J	330	U	54	JB
Fluoranthene	350	U	340	U	340	U	330	U	330	U	330	U
Pyrene	350	U	96	%	99	%	330	U	330	U	89	%
Butylbenzylphthalate	350	U	34	J	93	J	330	U	330	U	330	U
3,3'-Dichlorobenzidine	690	U	680	U	670	U	670	U	670	U	670	U
Benzo(a)anthracene	350	U	340	U	340	U	330	U	330	U	330	U
Chrysene	350	U	340	U	340	U	330	U	330	U	330	U
bis(2-Ethylhexyl)phthalate	350	U	340	U	340	U	330	U	330	U	330	U
Di-n-Octyl phthalate	350	U	340	U	340	U	330	U	330	U	330	U
Benzo(b)fluoranthene	350	U	340	U	340	U	330	U	330	U	330	U
Benzo(k)fluoranthene	350	U	340	U	340	U	330	U	330	U	330	U
Benzo(a)pyrene	350	U	340	U	340	U	330	U	330	U	330	U
Indeno(1,2,3-cd)pyrene	350	U	340	U	340	U	330	U	330	U	330	U
Dibenzo(a,h)anthracene	350	U	340	U	340	U	330	U	330	U	330	U
Benzo(g,h,i)perylene	350	U	340	U	340	U	330	U	330	U	330	U

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

9613402.1369 0000005

WESTON

ROY F. WESTON, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 07-10-91
RFW #: 9107L114, SEMIVOLATILE
W.O. #: 6168-02-01

NARRATIVE

One (1) soil sample was collected on 07-08-91.

The sample and its associated QC samples were extracted on 07-15-91 and analyzed according to criteria set forth in CLP SOW 2/88 (rev 5/89) for TCL Semivolatile target compounds on 07-18,23-91.

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

1. Non-target compounds were not 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 contained the common contaminant di-n-butylphthalate at a level less than the CRQL.

6. Internal standard areas were outside QC limits for samples 91LE0886-MB1 and B00X59 MSD. The laboratory blank was re-analyzed on 07-23-91 and reported. The original analysis and matrix spike analysis of sample B00X59 MSD fulfilled its re-analysis requirement.

8.23.91.

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

1B

SEMIVOLATILE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

BOOX59

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL

Lab Sample ID: 9107L114-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: S071809

Level: (low/med) LOW

Date Received: 07/10/91

% Moisture: not dec. 4 dec.

Date Extracted: 07/15/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 07/18/91

GPC Cleanup: (Y/N) N pH: 6.5

Dilution Factor: 1.00

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

CAS NO.	COMPOUND		
108-95-2	Phenol	350	U
111-44-4	bis(2-Chloroethyl)ether	350	U
95-57-8	2-Chlorophenol	350	U
541-73-1	1,3-Dichlorobenzene	350	U
106-46-7	1,4-Dichlorobenzene	350	U
100-51-6	Benzyl alcohol	350	U
95-50-1	1,2-Dichlorobenzene	350	U
95-48-7	2-Methylphenol	350	U
108-60-1	bis(2-Chloroisopropyl)ether	350	U
106-44-5	4-Methylphenol	350	U
621-64-7	N-Nitroso-Di-n-propylamine	350	U
67-72-1	Hexachloroethane	350	U
98-95-3	Nitrobenzene	350	U
78-59-1	Isophorone	350	U
88-75-5	2-Nitrophenol	350	U
105-67-9	2,4-Dimethylphenol	350	U
65-85-0	Benzoic acid	1700	U
111-91-1	bis(2-Chloroethoxy)methane	350	U
120-83-2	2,4-Dichlorophenol	350	U
120-82-1	1,2,4-Trichlorobenzene	350	U
91-20-3	Naphthalene	350	U
106-47-8	4-Chloroaniline	350	U
87-68-3	Hexachlorobutadiene	350	U
59-50-7	4-Chloro-3-methylphenol	350	U
91-57-6	2-Methylnaphthalene	350	U
77-47-4	Hexachlorocyclopentadiene	350	U
88-06-2	2,4,6-Trichlorophenol	350	U
95-95-4	2,4,5-Trichlorophenol	1700	U
91-58-7	2-Chloronaphthalene	350	U
88-74-4	2-Nitroaniline	1700	U
131-11-3	Dimethylphthalate	350	U
208-96-8	Acenaphthylene	350	U
606-20-2	2,6-Dinitrotoluene	350	U

SEMIVOLATILE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

BOOX59

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL Lab Sample ID: 9107L114-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S071809

Level: (low/med) LOW Date Received: 07/10/91

% Moisture: not dec. 4 dec. Date Extracted: 07/15/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/18/91

GPC Cleanup: (Y/N) N pH: 6.5 Dilution Factor: 1.00

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

CAS NO.	COMPOUND		
99-09-2	3-Nitroaniline	1700	U
83-32-9	Acenaphthene	350	U
51-28-5	2,4-Dinitrophenol	1700	U
100-02-7	4-Nitrophenol	1700	U
132-64-9	Dibenzofuran	350	U
121-14-2	2,4-Dinitrotoluene	350	U
84-66-2	Diethylphthalate	350	U
7005-72-3	4-Chlorophenyl-phenylether	350	U
86-73-7	Fluorene	350	U
100-01-6	4-Nitroaniline	1700	U
534-52-1	4,6-Dinitro-2-methylphenol	1700	U
86-30-6	N-Nitrosodiphenylamine (1)	350	U
101-55-3	4-Bromophenyl-phenylether	350	U
118-74-1	Hexachlorobenzene	350	U
87-86-5	Pentachlorophenol	1700	U
85-01-8	Phenanthrene	350	U
120-12-7	Anthracene	350	U
84-74-2	Di-n-Butylphthalate	2300	B
206-44-0	Fluoranthene	350	U
129-00-0	Pyrene	350	U
85-68-7	Butylbenzylphthalate	350	U
91-94-1	3,3'-Dichlorobenzidine	690	U
56-55-3	Benzo(a)anthracene	350	U
218-01-9	Chrysene	350	U
117-81-7	bis(2-Ethylhexyl)phthalate	350	U
117-84-0	Di-n-Octyl phthalate	350	U
205-99-2	Benzo(b)fluoranthene	350	U
207-08-9	Benzo(k)fluoranthene	350	U
50-32-8	Benzo(a)pyrene	350	U
193-39-5	Indeno(1,2,3-cd)pyrene	350	U
53-70-3	Dibenzo(a,h)anthracene	350	U
191-24-2	Benzo(g,h,i)perylene	350	U

(1) - Cannot be separated from Diphenylamine

1F

CLIENT SAMPLE NO.

BOOX59

SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL Lab Sample ID: 9107L114-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S071809

Level: (low/med) LOW Date Received: 07/10/91

% Moisture: not dec. 4 dec. Date Extracted: 07/15/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/18/91

GPC Cleanup: (Y/N) N pH: 6.5 Dilution Factor: 1.00

Number TICs found: 0

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

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

RADIOACTIVE SAMPLE EVALUATION

9613402.1374 0000002

I. Sample Custodian: C. PIPER **RFW Batch #** 91071114 **DATE:** 7-12-91

Package received from:

Client: WESTINGHOUSE Location: HANFORD, WA

Mode of Transport: __ UPS __ Fed EX X Other EMERY WORLDWIDE

DOT labels: __ Radioactive White I __ Radioactive Yellow II __ Radioactive Yellow III __ Other _____

Transport Index: 2474250262 Security Seal: X Yes __ No
2474250240
2474251461

II. Package Survey:

Gamma instrument make, model, serial #: LUDLUM MODEL 19 44415
Calibration date: 8-28-91

Source response check: Th-228
Source type and ID #: 8644-2 Response 170 microR/hr

Package Survey: (microR/hr) max. reading: 4 Background: 3

III. Sample Container Measurements:

Alpha instrument make, model, serial #: LUDLUM MODEL 43-558660
Calibration Date: 2-21-91 Efficiency factor: 8.69 dpm/cpm

Source Response Check: Th-230
Source type and ID #: Sn-12059 Response: 2600 cpm

Gamma instrument make, model, serial #: LUDLUM MODEL 19 58099
Calibration Date: 6-25-91 Gamma Background = 4 microR/hr

Source Response Check:
Source type and ID#: Ba-133, 6018500 Response: 900 microR/hr

Sample ID	Form (liq or sol)	RFW ID Batch	Gamma microR/hr	Alpha cpm	Alpha eff. fact	Alpha dpm	nCi/g	Mass (g)	nCi
B00X59	SOL		4	0			0.0269		
37413 - B00YM6	1		4	0			0		
B00XW0	LIQ		4	0			0.0018		
B00XZ6	1		4	0			0.0014		

CBP 7-10-91

RFW 21-21-013/A-05/91

NOT RADIOACTIVE CBP 7-10-91 14:36

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

RFW Batch Number: 9107L114 | Client: WESTINGHOUSE HANFORD | Work Order: 6168-02-01-0000 | Report Date: 08/21/91 14:23 | Page: 1

	Cust ID:	BOOX59		BOOX59		BOOX59		PBLK		PBLK BS	
Sample Information	RFW#:	001		001 MS		001 MSD		91LE0895-MB1		91LE0895-MB1	
	Matrix:	SOIL		SOIL		SOIL		SOIL		SOIL	
	D.F.:	1.00		4.00		4.00		1.00		4.00	
	Units:	ug/Kg		ug/Kg		ug/Kg		ug/Kg		ug/Kg	
Surrogate: Di-n-butylchlorendate		122	%	95	%	118	%	125	%	116	%
			fl		fl		fl		fl		fl
Alpha-BHC		7.9	U	31	U	32	U	8.0	U	32	U
Beta-BHC		7.9	U	31	U	32	U	8.0	U	32	U
Delta-BHC		7.9	U	31	U	32	U	8.0	U	32	U
gamma-BHC (Lindane)		7.9	U	65	%	90	%	8.0	U	80	%
Heptachlor		7.9	U	72	%	95	%	8.0	U	88	%
Aldrin		7.9	U	58	%	85	%	8.0	U	70	%
Heptachlor epoxide		7.9	U	31	U	32	U	8.0	U	32	U
Endosulfan I		7.9	U	31	U	32	U	8.0	U	32	U
Dieldrin		16	U	75	%	101	%	16	U	90	%
4,4'-DDE		16	U	63	U	64	U	16	U	64	U
Endrin		16	U	89	%	117	%	16	U	110	%
Endosulfan II		16	U	63	U	64	U	16	U	64	U
4,4'-DDD		16	U	63	U	64	U	16	U	64	U
Endosulfan sulfate		16	U	63	U	64	U	16	U	64	U
4,4'-DDT		2.6	J	69	%	98	%	16	U	85	%
Methoxychlor		79	U	310	U	320	U	80	U	320	U
Endrin ketone		16	U	63	U	64	U	16	U	64	U
alpha-Chlordane		79	U	310	U	320	U	80	U	320	U
gamma-Chlordane		79	U	310	U	320	U	80	U	320	U
Toxaphene		160	U	630	U	640	U	160	U	640	U
Aroclor-1016		79	U	310	U	320	U	80	U	320	U
Aroclor-1221		79	U	310	U	320	U	80	U	320	U
Aroclor-1232		79	U	310	U	320	U	80	U	320	U
Aroclor-1242		79	U	310	U	320	U	80	U	320	U
Aroclor-1248		79	U	310	U	320	U	80	U	320	U
Aroclor-1254		160	U	630	U	640	U	160	U	640	U
Aroclor-1260		160	U	630	U	640	U	160	U	640	U

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

9613402.1375 0000004

9613402.1376 5A

ROY F. WESTON, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 07-10-91
RFW #: 9107L114, PEST/PCB
W.O. #: 6168-02-01

NARRATIVE

One (1) soil sample was collected on 07-08-91.

The sample and its associated QC samples were extracted on 07-17-91 and analyzed according to criteria set forth in the Contract Laboratory Program for Pesticide and PCB target compounds on 08-13,14-91.

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

1. Linearity and breakdown criteria were met on the primary column.

2. For continuing calibration standards analyzed prior to the sample extracts, the 15% criterion for calibration factors was exceeded for endrin on the 2250/2401 column on 08-13-91 at 16:22.

3. Retention time criteria were met for all compounds on both the primary and confirmation columns.

4. All surrogate recoveries were within EPA QC limits.

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

6. All blank spike recoveries were within EPA QC limits.

7. The blank spike and matrix spike samples required four-fold dilutions to maintain the pesticide concentrations within the linear range of the instrument.

8.23.91.

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

9613402.1377 ID 0000013

CLIENT SAMPLE NO.

PESTICIDE ORGANICS ANALYSIS SHEET

BOOX59

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL Lab Sample ID: 9107L114-001

Sample wt/vol: 31.4 (g/mL) G Lab File ID: 08129113.45

Level: (low/med) LOW Date Received: 07/10/91

% Moisture: not dec. 4 dec. Date Extracted: 07/17/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/13/91

GPC Cleanup: (Y/N) Y pH: 6.5 Dilution Factor: 1.00

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

CAS NO.	COMPOUND		
319-84-6	Alpha-BHC	7.9	U
319-85-7	Beta-BHC	7.9	U
319-86-8	Delta-BHC	7.9	U
58-89-9	gamma-BHC (Lindane)	7.9	U
76-44-8	Heptachlor	7.9	U
309-00-2	Aldrin	7.9	U
1024-57-3	Heptachlor epoxide	7.9	U
959-98-8	Endosulfan I	7.9	U
60-57-1	Dieldrin	16	U
72-55-9	4,4'-DDE	16	U
72-20-8	Endrin	16	U
33213-65-9	Endosulfan II	16	U
72-54-8	4,4'-DDD	16	U
1031-07-8	Endosulfan sulfate	16	U
50-29-3	4,4'-DDT	2.6	J
72-43-5	Methoxychlor	79	U
53494-70-5	Endrin ketone	16	U
5103-71-9	alpha-Chlordane	79	U
5103-74-2	gamma-Chlordane	79	U
8001-35-2	Toxaphene	160	U
12674-11-2	Aroclor-1016	79	U
11104-28-2	Aroclor-1221	79	U
11141-16-5	Aroclor-1232	79	U
53469-21-9	Aroclor-1242	79	U
12672-29-6	Aroclor-1248	79	U
11097-69-1	Aroclor-1254	160	U
11096-82-5	Aroclor-1260	160	U

9613402.1378

ROY F. WESTON, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 07-10-91
RFW #: 9107L114
W.O. #: 6168-02-01

INORGANIC NARRATIVE

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

1. All preparation blanks were analyzed below the required detection limit.

2. All laboratory control standards (blank spikes) were within the control limits of 80-120%. All %RPD were within the 20% guidance limit.

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

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

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

SEP 1991
RECEIVED
DATA RECEIPT

8.27.91.

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

pas.21\i7-114

9613402.1379

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 08/22/91

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

WESTON BATCH #: 9107L114

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	BOOX59	% Solids	96.8		%	0.10
		Nitrite by IC	1.3	u	MG/KG	1.3
		Nitrate by IC	4.7		MG/KG	1.3
		Cyanide, Total	1.0	u	MG/KG	1.0
		Total Organic Carbon	0.19		%	0.10

WESTON

Roy F. Weston, INC.
Lionville Laboratory

CLIENT: WESTINGHOUSE HANFORD **SAMPLES RECEIVED:** 7/10/91
RFW #: 9107L114
W.O.#: 6168-02-01

METALS NARRATIVE

The set of samples consisted of one (1) soil sample collected on 7/8/91.

The samples were analyzed according to criteria set forth in CLP SOW 3/90.

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

1. ICVs, CCVs, and LCSs stock standards were purchased from Inorganic Ventures Laboratory.

2. All ICV and CCV values were within control limits.

3. All ICB and CCB values were within control limits.

4. All preparation blank values were within control limits.

5. All LCS results were within the 80-120% control limits.

6. All matrix spike recoveries were within the 75-125% control limits with the exception of Pb, Mn, Se and Ag. All corresponding samples were flagged with an "N" according to CLP protocol.

7. All duplicate analyses were within the 20% RPD control limit with the exception of Ba and Mn. All corresponding samples were flagged with a "*" according to CLP protocol.

8. Pb sample results were calculated by the method of standard addition (MSA). All corresponding samples were flagged with an "S" according to CLP protocol.

WESTON

9. For MSA, results reported on Form 8 are based on absorbance values. Results reported on other forms for elements which required MSA are based on the concentration corresponding to the reported absorbances appearing on Form 8. This is to provide consistency with method of calculation used for non-MSA results. Small differences due to rounding may be found between the MSA values calculated by the two methods.

10. 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 does not add reagents; HG2 is operated by the analyst and produces a strip chart. Reference SOP21-15-0245.1. Sample volumes and reagents for mercury determinations in water and soil have been proportionally scaled down to adapt to a new automated technique. The volume used for all water analysis is 33 mls. For soils, 0.1 gram of sample in a final volume of 50 mls.

11. Spike and Duplicate analyses were not performed on Cyanide.

Jack R. Tuschall, Ph.D.
Laboratory Manager
WESTON Analytical Laboratories

8.19.91.

Date

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 08/06/91

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

WESTON BATCH #: 9107L114

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	BOOX59	Silver, Total	1.5	u	MG/KG	1.5
		Aluminum, Total	2440		MG/KG	30.0
		Arsenic, Total	1.6		MG/KG	1.5
		Barium, Total	30.0	u	MG/KG	30.0
		Beryllium, Total	0.75	u	MG/KG	0.75
		Bismuth, Total	30.0	u	MG/KG	30.0
		Calcium, Total	7330		MG/KG	751
		Cadmium, Total	0.75	u	MG/KG	0.75
		Cobalt, Total	7.5	u	MG/KG	7.5
		Chromium, Total	1.5	u	MG/KG	1.5
		Copper, Total	11.8		MG/KG	3.8
		Iron, Total	6300		MG/KG	15.0
		Mercury, Total	0.10	u	MG/KG	0.10
		Potassium, Total	751	u	MG/KG	751
		Magnesium, Total	2110		MG/KG	751
		Manganese, Total	132		MG/KG	2.3
		Sodium, Total	751	u	MG/KG	751
		Nickel, Total	6.0	u	MG/KG	6.0
		Lead, Total	3.2		MG/KG	0.44
		Antimony, Total	9.0	u	MG/KG	9.0
		Selenium, Total	0.74	u	MG/KG	0.74
		Thallium, Total	1.5	u	MG/KG	1.5
		Vanadium, Total	7.7		MG/KG	7.5
		Zinc, Total	14.1		MG/KG	3.0

9613402.1383

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOOX59

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

Lab Code: WESTON Case No.: 200BP SAS No.: SDG No.: CLP114

Matrix (soil/water): SOIL Lab Sample ID: 910711401

Level (low/med): LOW Date Received: 7/10/91

% Solids: 96.8

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	2430.00			P
7440-36-0	Antimony	2.69	U		P
7440-38-2	Arsenic	1.60			F
7440-39-3	Barium	23.10	B	*	P
7440-41-7	Beryllium	.45	B		P
7440-43-9	Cadmium	.30	U		P
7440-70-2	Calcium	7300.00			P
7440-47-3	Chromium	.45	U		P
7440-48-4	Cobalt	3.15	B		P
7440-50-8	Copper	11.80			P
7439-89-6	Iron	6280.00			P
7439-92-1	Lead	3.19		NS	F
7439-95-4	Magnesium	2110.00			P
7439-96-5	Manganese	132.00		N*	P
7439-97-6	Mercury	.10	U		CV
7440-02-0	Nickel	5.85	B		P
7440-09-7	Potassium	573.00	B		P
7782-49-2	Selenium	.30	U	NW	F
7440-22-4	Silver	.74	B	N	P
7440-23-5	Sodium	90.00	B		P
7440-28-0	Thallium	.30	U		F
7440-62-2	Vanadium	7.69			P
7440-66-6	Zinc	14.00			P
	Cyanide	1.03	U		C

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

9613402.1384

VALIDATION SUMMARY

9613402.1385

9107414-WES-109

Science Applications International Corporation
An Employee-Owned Company

0540-PKB.92
May 19, 1992

Mr. Mark A. Buckmaster
Westinghouse Hanford Company
P.O. Box 1970, MSIN H4-55
Richland, WA 9932

Subject: Deliverable for 200-BP-1 Data Validation, Task Order S-92-19, WHC Contract No. MLW-SVV-073750

Dear Mr. Buckmaster:

Enclosed please find a copy of the Data Validation Summary Reports for Data Packages 9105L589, 9105L608, 9105L590 and 9107L114 produced under the referenced task order. This deliverable was prepared by a team of Golder Associates with support from SAIC under the direction of Mr. Kent Angelos.

Should you have any questions, please do not hesitate to contact the following: Mr. Kent Angelos, Golder Associates at (206) 883-0777, Mr. Mike Hoxie or myself at (509) 943-3133.

Sincerely yours,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

for P. K. Brockman
Program Manager

Enclosure
PKB/kdc

w. enc.
R. Bechtold, WHC
LB/Task S-92-19 Deliv File

w/o enc.
M. Adams, WHC
D. Caldwell, Golder
D. Martin, Albq
D. Wilson, WHC

w/enc. including original data package
T. Tonning, WHC

1845 Terminal Drive, Suite 202, Richland, Washington 99352 • (509) 943-3133
Other SAIC Offices: Albuquerque, Boston, Colorado Springs, Dayton, Huntsville, Las Vegas, Los Angeles, McLean, Oak Ridge, Orlando, Palo Alto, Seattle, Tucson

9613402.1386

Report To

Westinghouse Hanford Company
Richland, Washington

Data Validation Report
200-BP-1 RI/FS
Data Package: 9107L114-WES-109
Sample ID: B00X59
Sample Matrix: Soil
Analysis Type: Organics/Metals/Cyanide/Wet Chemistry

Prepared By

Golder Associates Inc.
Redmond, Washington

Validated by: _____
Kent Angelos
Associate

Reviewed by: _____
Sandy Sutton-Schildt
Staff Environmental Scientist

May 17, 1992

913-1719

9613402.1387

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3.1 MAJOR DEFICIENCIES	1
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LIST OF ATTACHMENTS

1 Glossary of Data Qualifiers
2 Summary of Data Qualifications - Form B-7
3 As-Qualified Data Summary
4 Data Review Supporting Documentation

1. INTRODUCTION

This report presents the results of data validation on data package 9107L114 consisting of one (1) soil sample for contract laboratory program target compound list (CLP/TCL) volatile, semivolatile and pesticide/PCB organic analysis; target analyte list (CLP/TAL) metals (including bismuth) and cyanide analysis; and wet chemistry analysis (percent solids, nitrite, nitrate, and total organic carbon).

Sample identifications, locations and sample dates are provided in the tabular data summary provided in Attachment 3. Data validation was conducted in accordance with the Westinghouse Hanford Company statement of work (WHC 1991) and validation procedures (WHC 1992).

2. DATA QUALITY OBJECTIVES

The data package was complete for all requested analyses and met the data quality objectives of the work plan. Data quality objectives for the project specified the use of CLP methods for TCL organics and TAL metals/cyanide analytes and the use of standard methods for all other parameters.

Sample quantitation limits were met with the exception of minor differences due to percent solids and sample dilution factors.

With the exception of the deficiencies identified in Section 3.0, the precision and accuracy goals of the work plan were met.

3. QUALIFIED DATA

This section presents a summary of the qualifications required based on validation of the subject data package.

3.1 MAJOR DEFICIENCIES

No major deficiencies were identified requiring rejection of any of the data contained in this data package.

3.2 MINOR DEFICIENCIES

The following qualifications were required as a result of the validation. Attachment 2 provides a summary of the samples affected.

3.2.1 Volatile Organics

- The associated initial calibration percent relative standard deviation and continuing calibration percent difference criteria were exceeded for chloromethane. The associated sample result has been qualified as estimated (UJ).

- Methylene chloride and acetone were detected in the associated method blank. Results for both compounds were less than 10 times the associated blank concentration and have been qualified as undetected (U).

3.2.2 Semivolatile Organics

- The associated continuing calibration %D criteria were exceeded for bis(2-chloroisopropyl)ether, n-nitroso-di-n-propylamine, hexachlorocyclopentadiene, 3-nitroaniline, 4-chlorophenyl-phenylether and 3,3'-dichlorobenzidine. The associated sample results have been qualified as estimated (UJ).

- Di-n-butylphthalate was detected in the associated method blank and the associated sample result was greater than ten times the method blank results, therefore, no qualification was required.

- Matrix spike/matrix spike duplicate recoveries in the sample and blank were acceptable with the exception of pentachlorophenol and 2,4-dinitrotoluene, however, no qualification is required since surrogate recoveries were acceptable. In addition, the spike recoveries were within the work plan data quality objective accuracy limits of ±25%.

- Internal standard areas were acceptable with the exception of areas for 1,3-dichlorobenzene-d4 in samples B00X59MSD and the method blank and for chrysene-d12 and perylene-d12 in the method blank reanalysis. No qualification was necessary since the internal standard criteria for the sample were met.

3.2.3 Pesticide/PCB Organics

- Extraction holding time was exceeded for the sample and all results have been qualified as estimated (UJ).

- Linearity criteria for aldrin and 4,4'-DDT were greater than 10% on the confirmation column, however no qualifiction is necessary since these compounds were not detected.

- Continuing calibration %D criteria were exceeded for endrin on the quantitation column on two occasions, however, no qualification is necessary since the compound was not detected.

- 4,4'-DDT was detected and confirmed in the sample at a low concentration (2.6 µg/Kg). Upon review of the method blank data, it was determined that 4,4'-DDT was also detected and confirmed in the blank but not reported by the laboratory. The blank concentration was calculated from the raw data (0.7 µg/Kg) and upon comparison the sample result is less than 5 times the blank result, therefore the sample result has been qualified as undetected (U) at the CRQL (16 µg/Kg).

3.2.4 Metals and Cyanide

- Barium, beryllium, copper, manganese, nickel, vanadium and zinc were detected at low concentrations in the associated calibration and preparation blanks, however, no qualification was necessary since the raw sample concentrations were greater than five times the blank concentrations.

- Spike sample recoveries were acceptable with the exception of arsenic, lead, manganese, selenium, silver and thallium. The associated sample results have been qualified as estimated (J for detects and UJ for non-detects).

- Graphite furnace analytical spike recoveries were acceptable with the exception of lead and selenium. Method of standard additions was conducted for lead in accordance with the analytical statement of work, therefore, no qualification is necessary. The result for selenium has been qualified as estimated (UJ).

3.2.5 Wet Chemistry

- Sample holding times were met with the exception of nitrate and nitrite, therefore results for these analytes have been qualified as estimated (J for detects, UJ for non-detects).

- The TOC analysis was performed by a gravimetric procedure and we are unable to fully validate the data since no sample preparation bench sheets or analytical method references are provided. Based on the raw data provided, the results appear to be valid, however we recommend the laboratory provide a method reference and calculation formulae. We are able to recalculate the gravimetric organic carbon results by using the following formula: TOC = (percent organic matter - 0.35) ÷ 1.80 which comes from "Methods of Soil Analysis, Part 2, Chemical and Microbiological Properties. 2nd Ed., American Society of Agronomy, No. 9, 1982, pp 574".

4. CONCLUSIONS

Sections 1 through 3 present a summary of the data quality for the subject data package. The results contained in this report are acceptable for use as qualified. The attachments provide supporting documentation and a tabular summary of the qualified data. The original, as-received data package is enclosed for submittal to the project QA record.

5. REFERENCES

WHC, 1991, Westinghouse Hanford Company, Validation of 200-BP-1 Data, Statement of Work, Revision A, November 1991. Westinghouse Hanford Company, Richland, Washington.

WHC, 1992, Westinghouse Hanford Company, Data Validation Procedures for Chemical Analyses, WHC-SD-EN-SPP-002, Rev. 2, April, 1992. Westinghouse Hanford Company, Richland, Washington.

9613402.1391

ATTACHMENT 1

GLOSSARY OF DATA REPORTING QUALIFIERS

B - Indicates the compound or analyte was analyzed for and detected. The value reported is less than the contract required quantitation limit (CRQL) but greater than the instrument detection limit (IDL).

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. The data are usable for decision making purposes.

UJ - Indicates the compound or analyte was analyzed for and not detected. Due to identified quality control deficiency identified during data validation the value reported may not accurately reflect the sample quantitation limit. The data are usable for decision making purposes.

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

9613402.1392

ATTACHMENT 2

SUMMARY OF DATA QUALIFICATIONS

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: 9107L114	REVIEWER: KMA	DATE: 5/13/92	PAGE 1 OF 2
COMMENTS: Volatiles, BNA, Pest/PCB			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
Chloromethane	UJ	1500X59	Init Cal
			Cont Cal
			%RSD/%D
			Exceeded
Methylene Cl	U	3000X59	Results <
Acetone	U		10X Blank
Bis(2-chloro iso-propyl)ether	UJ	3000X59	Cont. Cal %D >25%
Hexachloro cyclo pentadiene			
3-nitroaniline			
4-chlorophenyl-phenyl ether			
3,3'-Dichloro-benzidine			
N-nitroso-di-n-propylamine	UJ		
Di-n-butylphthalate	none	3000X59	Result >10X Blank
All Pest./PCBs	UJ	3000X59	Extraction holding time exceeded

DATA QUALIFICATION SUMMARY - FORM B-7

SDG: 9107L114	REVIEWER: KMA	DATE: 5/13/92	PAGE 2 OF 2
COMMENTS: Pest/PCB, Metals, Wet Chemistry			
COMPOUND	QUALIFIER	SAMPLES AFFECTED	REASON
4,4'-DDT	UJ	B00X59	Result <10X
			Blank []
Arsenic	J	B00X59	Spike %R
Lead	J		<75% >30%
Manganese	J		
Selenium	UJ		
Silver	J		
Thallium	UJ		
Nitrate by IC	J	B00X59	Holding time
Nitrite by IC	UJ		exceeded

9613402.1395

ATTACHMENT 3

AS QUALIFIED DATA SUMMARY

Project	200-BP-1																		
Laboratory	WESTON																		
Case	SDG	9107L114																	
Sample Number		B00X59																	
Location		216-B-57A																	
Remarks		26.5-29.0																	
Sample Date		7/8/91																	
Analysis Date		7/11/91																	
Organic Compounds	CRQL	Result	Q		Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Chloromethane	10	10	UJ																
Bromomethane	10	10	U																
Vinyl Chloride	10	10	U																
Chloroethane	10	10	U																
Methylene Chloride	5	16	U																
Acetone	10	31	U																
Carbon Disulfide	5	5	U																
1,1-Dichloroethene	5	5	U																
1,1-Dichloroethane	5	5	U																
1,2-Dichloroethene (total)	5	5	U																
Chloroform	5	5	U																
1,2-Dichloroethane	5	5	U																
2-Butanone	10	10	U																
1,1,1-Trichloroethane	5	5	U																
Carbon Tetrachloride	5	5	U																
Vinyl Acetate	10	10	U																
Bromodichloromethane	5	5	U																
1,2-Dichloropropane	5	5	U																
cis-1,3-Dichloropropene	5	5	U																
Trichloroethene	5	5	U																
Dibromochloromethane	5	5	U																
1,1,2-Trichloroethane	5	5	U																
Benzene	5	5	U																
Trans-1,3-Dichloropropene	5	5	U																
Bromoform	5	5	U																
4-Methyl-2-pentanone	10	10	U																
2-Hexanone	10	10	U																
Tetrachloroethene	5	5	U																
1,1,2,2-Tetrachloroethane	5	5	U																
Toluene	5	5	U																
Chlorobenzene	5	5	U																
Ethylbenzene	5	5	U																
Styrene	5	5	U																
Xylene (total)	5	5	U																

9613402.1396

Project		200-BP-1																			
Laboratory		WESTON																			
Case		SDG	9107L114																		
Sample Number			B00X59																		
Location			216-B-57A																		
Remarks			26.5-29.0																		
Sample Date			7/8/91																		
Extraction Date			7/15/91																		
Analysis Date			7/18/91																		
Organic Compounds	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Phenol	330	350	U																		
bis(2-Chloroethyl)ether	330	350	U																		
2-Chlorophenol	330	350	U																		
1,3-Dichlorobenzene	330	350	U																		
1,4-Dichlorobenzene	330	350	U																		
Benzyl alcohol	330	350	U																		
1,2-Dichlorobenzene	330	350	U																		
2-Methylphenol	330	350	U																		
bis(2-Chloroisopropyl)ether	330	350	UJ																		
4-Methylphenol	330	350	U																		
N-Nitroso-di-n-propylamine	330	350	UJ																		
Hexachloroethane	330	350	U																		
Nitrobenzene	330	350	U																		
Isophorone	330	350	U																		
2-Nitrophenol	330	350	U																		
2,4-Dimethylphenol	330	350	U																		
Benzoic acid	1600	1700	U																		
bis(2-Chloroethoxy)methane	330	350	U																		
2,4-Dichlorophenol	330	350	U																		
1,2,4-Trichlorobenzene	330	350	U																		
Naphthalene	330	350	U																		
4-Chloroaniline	330	350	U																		
Hexachlorobutadiene	330	350	U																		
4-Chloro-3-methylphenol	330	350	U																		
2-Methylnaphthalene	330	350	U																		
Hexachlorocyclopentadiene	330	350	UJ																		
2,4,6-Trichlorophenol	330	350	U																		
2,4,5-Trichlorophenol	1600	1700	U																		
2-Chloronaphthalene	330	350	U																		
2-Nitroaniline	1600	1700	U																		
Dimethylphthalate	330	350	U																		
Acenaphthylene	330	350	U																		
2,6-Dinitrotoluene	330	350	U																		

9613402.1397

Project		200-BP-1																			
Laboratory		WESTON																			
Case		SDG 9107L114																			
Sample Number		B00X59																			
Location		216-B-57A																			
Remarks		26.5-29.0																			
Sample Date		7/8/91																			
Extraction Date		7/15/91																			
Analysis Date		7/18/91																			
Organic Compounds	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
3-Nitroaniline	1600	1700	UJ																		
Acenaphthene	330	350	U																		
2,4-Dinitrophenol	1600	1700	U																		
4-Nitrophenol	1600	1700	U																		
Dibenzofuran	330	350	U																		
2,4-Dinitrotoluene	330	350	U																		
Diethylphthalate	330	350	U																		
4-Chlorophenyl-phenyl ether	330	350	UJ																		
Fluorene	330	350	U																		
4-Nitroaniline	1600	1700	U																		
4,6-Dinitro-2-methylphenol	1600	1700	U																		
N-Nitrosodiphenylamine	330	350	U																		
4-Bromophenyl-phenylether	330	350	U																		
Hexachlorobenzene	330	350	U																		
Pentachlorophenol	1600	1700	U																		
Phenanthrene	330	350	U																		
Anthracene	330	350	U																		
Di-n-butylphthalate	330	2300																			
Fluoranthene	330	350	U																		
Pyrene	330	350	U																		
Butylbenzylphthalate	330	350	U																		
3,3'-Dichlorobenzidine	660	690	UJ																		
Benz(a)anthracene	330	350	U																		
Chrysene	330	350	U																		
bis(2-Ethylhexyl)phthalate	330	350	U																		
Di-n-octylphthalate	330	350	U																		
Benzo(b)fluoranthene	330	350	U																		
Benzo(k)fluoranthene	330	350	U																		
Benzo(a)pyrene	330	350	U																		
Indeno(1,2,3-cd)pyrene	330	350	U																		
Dibenzo(a,h)anthracene	330	350	U																		
Benzo(g,h,i)perylene	330	350	U																		

9613402.1398

Project	200-BP-1																		
Laboratory	WESTON																		
Case	SDG	9107L114																	
Sample Number		B00X59																	
Location		216-B-57A																	
Remarks		26.5-29.0																	
Sample Date		7/8/91																	
Inorganic Analytes	CRQL	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q	Result	Q
Aluminum	40	2430																	
Antimony	12	2.69	U																
Arsenic	2	1.6	J																
Barium	40	23.1	B																
Beryllium	1	0.45	B																
Cadmium	1	0.3	U																
Calcium	1000	7300																	
Chromium	2	0.45	U																
Cobalt	10	3.15	B																
Copper	5	11.8																	
Iron	20	6280																	
Lead	1	3.19	J																
Magnesium	1000	2110																	
Manganese	3	132	J																
Mercury	0.04	0.1	U																
Nickel	8	5.85	B																
Potassium	1000	573	B																
Selenium	1	0.3	UJ																
Silver	2	0.74	J																
Sodium	1000	90	B																
Thallium	2	0.3	UJ																
Vanadium	10	7.69																	
Zinc	4	14																	
Cyanide	0.5	1.03	U																
Bismuth	12	30	U																
Percent Solids	0.1	96.8																	
Nitrite by IC	4	1.3	UJ																
Nitrate by IC	4	4.7	J																
Total Organic Carbon, %	0.1	0.19																	

9613402.1399

9613402.1400

1A

VOLATILE ORGANICS ANALYSIS SHEET

0000017 CLIENT SAMPLE NO.

BOOX59
216-B-57A
26.5-29.0

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL

Lab Sample ID: 9107L114-001

Sample wt/vol: 5.10 (g/mL) G

Lab File ID: X071105

Level: (low/med) LOW

Date Received: 07/10/91

% Moisture: not dec. 3

Date Analyzed: 07/11/91

Column: (pack/cap) PACK

Dilution Factor: ~~0.980~~ 1.0

5/12/92

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

CAS NO.	COMPOUND		
74-87-3	Chloromethane	10	~~U~~ UJ
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	U
75-09-2	Methylene Chloride	16	~~B~~ U
67-64-1	Acetone	31	~~B~~ U
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

5/12/92

9613402.1401

1E

0000018 CLIENT SAMPLE NO.

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

BOOX59
216-B-57A
26.5-29.0

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL

Lab Sample ID: 9107L114-001

Sample wt/vol: 5.10 (g/mL) G

Lab File ID: Y071105

Level: (low/med) LOW

Date Received: 07/10/91

% Moisture: not dec. 3

Date Analyzed: 07/11/91

Column: (pack/cap) PACK

Dilution Factor: ~~0.980~~ 1.0 [illegible] 5/12/92

Number TICs found: 0

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

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

[illegible] 5/12/92

9613402.1402

1B 0000010 CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS SHEET

BOOX59
216-B-57A
26.5-29.0

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL Lab Sample ID: 9107L114-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S071809

Level: (low/med) LOW Date Received: 07/10/91

% Moisture: not dec. 4 dec. Date Extracted: 07/15/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/18/91

GPC Cleanup: (Y/N) N pH: 6.5 Dilution Factor: 1.00

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

CAS NO.	COMPOUND			
108-95-2	Phenol	350	U	
111-44-4	bis(2-Chloroethyl)ether	350	U	
95-57-8	2-Chlorophenol	350	U	
541-73-1	1,3-Dichlorobenzene	350	U	
106-46-7	1,4-Dichlorobenzene	350	U	
100-51-6	Benzyl alcohol	350	U	
95-50-1	1,2-Dichlorobenzene	350	U	
95-48-7	2-Methylphenol	350	U	
108-60-1	bis(2-Chloroisopropyl)ether	350	~~U~~	UJ
106-44-5	4-Methylphenol	350	U	
621-64-7	N-Nitroso-Di-n-propylamine	350	~~U~~	UJ [illegible] 5/13/92
67-72-1	Hexachloroethane	350	U	
98-95-3	Nitrobenzene	350	U	
78-59-1	Isophorone	350	U	
88-75-5	2-Nitrophenol	350	U	
105-67-9	2,4-Dimethylphenol	350	U	
65-85-0	Benzoic acid	1700	U	
111-91-1	bis(2-Chloroethoxy)methane	350	U	
120-83-2	2,4-Dichlorophenol	350	U	
120-82-1	1,2,4-Trichlorobenzene	350	U	
91-20-3	Naphthalene	350	U	
106-47-8	4-Chloroaniline	350	U	
87-68-3	Hexachlorobutadiene	350	U	
59-50-7	4-Chloro-3-methylphenol	350	U	
91-57-6	2-Methylnaphthalene	350	U	
77-47-4	Hexachlorocyclopentadiene	350	~~U~~	UJ
88-06-2	2,4,6-Trichlorophenol	350	U	
95-95-4	2,4,5-Trichlorophenol	1700	U	
91-58-7	2-Chloronaphthalene	350	U	
88-74-4	2-Nitroaniline	1700	U	
131-11-3	Dimethylphthalate	350	U	
208-96-8	Acenaphthylene	350	U	
606-20-2	2,6-Dinitrotoluene	350	U	

[illegible] 5/12/92

9613402.1403

1C 0000015 CLIENT SAMPLE NO.

SEMIVOLATILE ORGANICS ANALYSIS SHEET

BOOX59
216-B-57A
26.5-29.0

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL Lab Sample ID: 9107L114-001

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S071809

Level: (low/med) LOW Date Received: 07/10/91

% Moisture: not dec. 4 dec. Date Extracted: 07/15/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/18/91

GPC Cleanup: (Y/N) N pH: 6.5 Dilution Factor: 1.00

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

CAS NO.	COMPOUND			
99-09-2	3-Nitroaniline	1700	~~U~~	UJ
83-32-9	Acenaphthene	350	U	
51-28-5	2,4-Dinitrophenol	1700	U	
100-02-7	4-Nitrophenol	1700	U	
132-64-9	Dibenzofuran	350	U	
121-14-2	2,4-Dinitrotoluene	350	U	
84-66-2	Diethylphthalate	350	U	
7005-72-3	4-Chlorophenyl-phenylether	350	~~U~~	UJ
86-73-7	Fluorene	350	U	
100-01-6	4-Nitroaniline	1700	U	
534-52-1	4,6-Dinitro-2-methylphenol	1700	U	
86-30-6	N-Nitrosodiphenylamine (1)	350	U	
101-55-3	4-Bromophenyl-phenylether	350	U	
118-74-1	Hexachlorobenzene	350	U	
87-86-5	Pentachlorophenol	1700	U	
85-01-8	Phenanthrene	350	U	
120-12-7	Anthracene	350	U	
84-74-2	Di-n-Butylphthalate	2300	~~B~~	Valid >10X Blank
206-44-0	Fluoranthene	350	U	
129-00-0	Pyrene	350	U	
85-68-7	Butylbenzylphthalate	350	U	
91-94-1	3,3'-Dichlorobenzidine	690	~~U~~	UJ
56-55-3	Benzo(a)anthracene	350	U	
218-01-9	Chrysene	350	U	
117-81-7	bis(2-Ethylhexyl)phthalate	350	U	
117-84-0	Di-n-Octyl phthalate	350	U	
205-99-2	Benzo(b)fluoranthene	350	U	
207-08-9	Benzo(k)fluoranthene	350	U	
50-32-8	Benzo(a)pyrene	350	U	
193-39-5	Indeno(1,2,3-cd)pyrene	350	U	
53-70-3	Dibenzo(a,h)anthracene	350	U	
191-24-2	Benzo(g,h,i)perylene	350	U	

(1) - Cannot be separated from Diphenylamine

FORM 1 SV-2 12/88 Rev.

5/12/92

5/12/92

9613402.1404

0000026

1F

SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

BOOX59
216-B-57A
26.5-29.0

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL

Lab Sample ID: 9107L114-001

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: S071809

Level: (low/med) LOW

Date Received: 07/10/91

% Moisture: not dec. 4 dec.

Date Extracted: 07/15/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 07/18/91

GPC Cleanup: (Y/N) N pH: 6.5

Dilution Factor: 1.00

Number TICs found: 0

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

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

5/12/92

9613402.1405

1D 0000013

PESTICIDE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

BOOX59 216-B-57A 26.5-29.0

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL Lab Sample ID: 9107L114-001

Sample wt/vol: 31.4 (g/mL) G Lab File ID: 08129113.45

Level: (low/med) LOW Date Received: 07/10/91

% Moisture: not dec. 4 dec. Date Extracted: 07/17/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/13/91

GPC Cleanup: (Y/N) Y pH: 6.5 Dilution Factor: 1.00

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

CAS NO.	COMPOUND		
319-84-6	Alpha-BHC	7.9	U
319-85-7	Beta-BHC	7.9	U
319-86-8	Delta-BHC	7.9	U
58-89-9	gamma-BHC (Lindane)	7.9	U
76-44-8	Heptachlor	7.9	U
309-00-2	Aldrin	7.9	U
1024-57-3	Heptachlor epoxide	7.9	U
959-98-8	Endosulfan I	7.9	U
60-57-1	Dieldrin	16	U
72-55-9	4,4'-DDE	16	U
72-20-8	Endrin	16	U
33213-65-9	Endosulfan II	16	U
72-54-8	4,4'-DDD	16	U
1031-07-8	Endosulfan sulfate	16	U
50-29-3	4,4'-DDT	16 ~~2.6~~	J
72-43-5	Methoxychlor	79	U
53494-70-5	Endrin ketone	16	U
5103-71-9	alpha-Chlordane	79	U
5103-74-2	gamma-Chlordane	79	U
8001-35-2	Toxaphene	160	U
12674-11-2	Aroclor-1016	79	U
11104-28-2	Aroclor-1221	79	U
11141-16-5	Aroclor-1232	79	U
53469-21-9	Aroclor-1242	79	U
12672-29-6	Aroclor-1248	79	U
11097-69-1	Aroclor-1254	160	U
11096-82-5	Aroclor-1260	160	U

UJ

~~J~~ UJ

UJ

MWS 5/12/92

FORM 1 PEST 12/88 Rev.

MWS 5/12/92

9613402.1406

1

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

BOOX59
216-0-57A
26.5 - 29.0

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

Lab Code: WESTON Case No.: 200BP SAS No.: SDG No.: CLP114

Matrix (soil/water): SOIL Lab Sample ID: 910711401

Level (low/med): LOW Date Received: 7/10/91

% Solids: 96.8

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

CAS No.	Analyte	Concentration	C	Q	M	
7429-90-5	Aluminum	2430.00			P	
7440-36-0	Antimony	2.69	U		P	
7440-38-2	Arsenic	1.60			F	J
7440-39-3	Barium	23.10	B	*	P	
7440-41-7	Beryllium	.45	B		P	
7440-43-9	Cadmium	.30	U		P	
7440-70-2	Calcium	7300.00			P	
7440-47-3	Chromium	.45	U		P	
7440-48-4	Cobalt	3.15	B		P	
7440-50-8	Copper	11.80			P	
7439-89-6	Iron	6280.00			P	
7439-92-1	Lead	3.19		~~NS~~	F	J
7439-95-4	Magnesium	2110.00			P	
7439-96-5	Manganese	132.00		~~N*~~	P	J
7439-97-6	Mercury	.10	U		CV	
7440-02-0	Nickel	5.85	B		P	
7440-09-7	Potassium	573.00	B		P	
7782-49-2	Selenium	.30	~~U~~	~~NW~~	F	UJ
7440-22-4	Silver	.74	~~B~~	~~N~~	P	J
7440-23-5	Sodium	90.00	B		P	
7440-28-0	Thallium	.30	~~U~~		F	UJ
7440-62-2	Vanadium	7.69			P	
7440-66-6	Zinc	14.00			P	
	Cyanide	1.03	U		C	
7440-69-9	Bismuth	30.0	U		P	

Color Before: BROWN Clarity Before: Texture: FINE

Color After: BROWN Clarity After: Artifacts:

Comments:

5/12/92

9613402.1407

ROY F. WESTON INC.

INORGANICS DATA SUMMARY REPORT 08/22/91

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

WESTON BATCH #: 9107L114

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT
-001	BOOX59	% Solids	96.8		%	0.10
	216-B-57A 26.5-29.0	Nitrite by IC	1.3	~~u~~	MG/KG UJ	1.3
		Nitrate by IC	4.7	~~J~~	MG/KG J	1.3
		Cyanide, Total	1.0	u	MG/KG	1.0
		Total Organic Carbon	0.19		%	0.10

5/12/92

9613402.1408

ATTACHMENT 4

DATA REVIEW SUPPORTING DOCUMENTATION

9613402.1409

VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-1

PROJECT: 200 BP1	REVIEWER: KWA	DATE: 5/12/92
LABORATORY: Weston	CASE: —	SDG: 9107L114
SAMPLES/MATRIX:		
B00X59 Soil		

1. DATA PACKAGE COMPLETENESS

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

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

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? MS/MSD conducted on 9107L094 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):

See attached for deficiencies

[illegible]
5/12/96

9613402.1416

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

DATE RECEIVED: 07/10/91 RFW LOT # :9107L114

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	Days
BOOX59	001	S	91LVY131	07/08/91	N/A	07/11/91	3
LAB QC:							
VBLK	MB1	S	91LVY131	N/A	N/A	07/11/91	

Holding time met
[illegible]
5/12/92

SEP 1991
RECEIVED
DATA RECEIPT

9613402.1417

0000027

6A

VOLATILE ORGANICS INTITIAL CALIBRATION DATA

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

Case No.: WESTINGHOUSE HANFORD RFW Lot: 9107L114

Instrument ID: 5100Y Calibration Date(s): 07/03/91 07/03/91

Matrix:(soil/water) SOIL Level:(low/med) LOW Column:(pack/cap) PACK

Min RRF for SPCC(#) = 0.300 (0.250 for Bromoform) Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 = Y070306 RRF50 = Y070307
RRF100= Y070308 RRF150= Y070309 RRF200= Y070310

COMPOUND	RRF20	RRF50	RRF100	RRF150	RRF200	$\overline{RRF}$	% RSD
Chloromethane #	1.110	0.914	0.615	0.471	0.363	0.695	44.8#
Bromomethane	1.693	1.553	1.440	1.287	1.027	1.400	18.3
Vinyl Chloride *	1.411	1.346	1.214	1.145	0.969	1.217	14.3*
Chloroethane	0.729	0.703	0.658	0.617	0.568	0.655	9.9
Methylene Chloride	1.950	1.701	2.033	1.798	1.611	1.819	9.5
Acetone	0.761	0.696	0.670	0.605	0.547	0.656	12.6
Carbon Disulfide	3.654	3.745	3.833	3.902	3.848	3.796	2.6
1,1-Dichloroethene *	1.445	1.430	1.440	1.388	1.317	1.404	3.8*
1,1-Dichloroethane #	2.707	2.603	2.577	2.543	2.441	2.574	3.7#
1,2-Dichloroethene (total)	1.605	1.600	1.563	1.571	1.508	1.569	2.5
Chloroform *	3.351	3.293	3.247	3.219	3.095	3.241	3.0*
1,2-Dichloroethane	2.481	2.369	2.361	2.333	2.253	2.359	3.5
2-Butanone	0.199	0.186	0.190	0.185	0.174	0.187	4.8
1,1,1-Trichloroethane	0.638	0.636	0.653	0.669	0.647	0.649	2.1
Carbon Tetrachloride	0.558	0.570	0.596	0.612	0.598	0.587	3.8
Vinyl Acetate	0.687	0.649	0.676	0.731	0.708	0.690	4.5
Bromodichloromethane	0.625	0.640	0.675	0.694	0.676	0.662	4.3
1,2-Dichloropropane *	0.379	0.370	0.376	0.383	0.373	0.376	1.3*
cis-1,3-Dichloropropene	0.558	0.553	0.568	0.588	0.575	0.568	2.4
Trichloroethene	0.533	0.539	0.538	0.525	0.504	0.528	2.7
Dibromochloromethane	0.531	0.563	0.614	0.643	0.631	0.596	8.0
1,1,2-Trichloroethane	0.384	0.371	0.387	0.395	0.379	0.383	2.3
Benzene	1.050	1.026	1.036	1.056	1.015	1.037	1.6
Trans-1,3-Dichloropropene	0.517	0.546	0.572	0.590	0.561	0.557	5.0
Bromoform #	0.337	0.385	0.440	0.476	0.470	0.422	14.1#
4-Methyl-2-pentanone	0.391	0.359	0.360	0.381	0.353	0.369	4.4
2-Hexanone	0.295	0.275	0.289	0.306	0.282	0.289	4.1
Tetrachloroethene	0.523	0.531	0.544	0.560	0.535	0.539	2.6
1,1,2,2-Tetrachloroethane #	0.482	0.461	0.503	0.590	0.557	0.519	10.3#
Toluene *	0.742	0.743	0.756	0.787	0.754	0.756	2.4*
Chlorobenzene #	1.051	1.038	1.049	1.072	1.024	1.047	1.7#
Ethylbenzene *	0.486	0.476	0.480	0.490	0.471	0.481	1.6*
Styrene	0.852	0.851	0.879	0.904	0.866	0.870	2.5
Xylene (total)	0.544	0.518	0.526	0.538	0.517	0.529	2.3
Toluene-d8	0.991	1.012	1.006	1.044	1.016	1.014	1.9
Bromofluorobenzene	0.620	0.601	0.581	0.607	0.596	0.601	2.4
1,2-Dichloroethane-d4	1.923	1.888	1.841	1.846	1.798	1.859	2.6

9613402.1418

0000049

7A

VOLATILE CONTINUING CALIBRATION CHECK

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

Case No.: WESTINGHOUSE HANFORD RFW Lot: 9107L114

Instrument ID: 5100Y Calibration Date: 07/11/91 Time: 1010

Lab File ID: Y071102 Init. Calib. Date(s): 07/03/91 07/03/91

Matrix:(soil/water) SOIL Level:(low/med) LOW Column:(pack/cap) PACK

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform Max %D for CCC(*) = 25.0%

sample analytical

UJ

COMPOUND		RRF	RRF50	%D	
Chloromethane	#	0.695	0.950	-36.7	#
Bromomethane		1.400	1.533	-9.5	
Vinyl Chloride	*	1.217	1.286	-5.7	*
Chloroethane		0.655	0.749	-14.4	
Methylene Chloride		1.819	1.692	7.0	
Acetone		0.656	0.726	-10.7	
Carbon Disulfide		3.796	3.745	1.3	
1,1-Dichloroethene	*	1.404	1.463	-4.2	*
1,1-Dichloroethane	#	2.574	2.835	-10.1	#
1,2-Dichloroethene (total)		1.569	1.652	-5.3	
Chloroform	*	3.241	3.536	-9.1	*
1,2-Dichloroethane		2.359	2.554	-8.3	
2-Butanone		0.187	0.203	-8.6	
1,1,1-Trichloroethane		0.649	0.641	1.2	
Carbon Tetrachloride		0.587	0.569	3.1	
Vinyl Acetate		0.690	0.747	-8.3	
Bromodichloromethane		0.662	0.671	-1.4	
1,2-Dichloropropane	*	0.376	0.408	-8.5	*
cis-1,3-Dichloropropene		0.568	0.587	-3.3	
Trichloroethene		0.528	0.520	1.5	
Dibromochloromethane		0.596	0.569	4.5	
1,1,2-Trichloroethane		0.383	0.389	-1.6	
Benzene		1.037	1.073	-3.5	
Trans-1,3-Dichloropropene		0.557	0.587	-5.4	
Bromoform	#	0.422	0.355	15.9	#
4-Methyl-2-pentanone		0.369	0.406	-10.0	
2-Hexanone		0.289	0.317	-9.7	
Tetrachloroethene		0.539	0.510	5.4	
1,1,2,2-Tetrachloroethane	#	0.519	0.521	-0.4	#
Toluene	*	0.756	0.756	0.0	*
Chlorobenzene	#	1.047	1.036	1.1	#
Ethylbenzene	*	0.481	0.468	2.7	*
Styrene		0.870	0.878	-0.9	
Xylene (total)		0.529	0.516	2.5	
Toluene-d8		1.014	0.993	2.1	
Bromofluorobenzene		0.601	0.606	-0.8	
1,2-Dichloroethane-d4		1.859	1.960	-5.4	

5/18/92

9613402.1419

1A

VOLATILE ORGANICS ANALYSIS SHEET

0000059 CLIENT SAMPLE NO.

VBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL

Lab Sample ID: 91LVY131-MB1

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

Lab File ID: Y071103

Level: (low/med) LOW

Date Received: 07/11/91

% Moisture: not dec. 0

Date Analyzed: 07/11/91

Column: (pack/cap) PACK

Dilution Factor: 1.00

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

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	
67-64-1	Acetone	10	
75-15-0	Carbon Disulfide	5	U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5	U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	U
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	cis-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5	U
10061-02-6	Trans-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
108-10-1	4-Methyl-2-pentanone	10	U
591-78-6	2-Hexanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5	U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Xylene (total)	5	U

x10 = 50
x10 = 100

5/12/92

9613402.1420

1E

VOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

000006 0 CLIENT SAMPLE NO.

VBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL

Lab Sample ID: 91LVY131-MB1

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

Lab File ID: Y071103

Level: (low/med) LOW

Date Received: 07/11/91

% Moisture: not dec. 0

Date Analyzed: 07/11/91

Column: (pack/cap) PACK

Dilution Factor: 1.00

Number TICs found: 0

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

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

9613402.1421

SEMI-VOLATILE ORGANIC DATA VALIDATION CHECKLIST - FORM A-2

PROJECT: 200 BP 1	REVIEWER: KMA	DATE: 5/12/92
LABORATORY: Weston	CASE: —	SDG: 9107L114
SAMPLES/MATRIX:		
B07X59 Soil		

1. DATA PACKAGE COMPLETENESS

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

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

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

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2. HOLDING TIMES

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

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

3. INSTRUMENT CALIBRATION, TUNING AND PERFORMANCE CHECKS

3.1 GC/MS TUNING AND PERFORMANCE CHECKS

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

ACTION: If the mass calibration is out of specification but within the expanded criteria, qualify associated data as estimated (J for detects and UJ for nondetects). If all tuning criteria are not met, qualify all associated data as unusable (R).

3.2 INITIAL CALIBRATION

Is an initial calibration report provided for all instruments?	(Yes)	No	N/A
Are all RSD values ≤30% (2/88 SOW)?	(Yes)	No	N/A
Are all RRF values ≥0.05 (2/88 SOW)?	(Yes)	No	N/A
Are all applicable RSD values ≤20.5% (3/90 SOW)?	Yes	No	(N/A)
Are all applicable RSD values ≤40% (3/90 SOW)?	Yes	No	(N/A)

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

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

3.3. CONTINUING CALIBRATION

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

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

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory conducted a method blank analysis per matrix for every extraction batch?	Yes	No	N/A
Are compounds reported in the laboratory blanks?	Yes	No	N/A

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

4.2. FIELD BLANKS

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

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

5. ACCURACY

5.1 SURROGATE RECOVERY/SYSTEM MONITORING COMPOUND RECOVERY

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

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

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

ACTION: Qualify all associated data as estimated (J for detects and UJ for nondetects) if at least two semivolatile surrogates are out of specification. If any surrogate is below 10% recovery qualify associated detected results as estimated (J) and associated nondetect results as unusable (R). If method blank surrogates are out of specification and associated sample surrogates are acceptable no qualification is required, however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

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

Are MS/MSD recoveries within specification? see attached 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.

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5.3 PERFORMANCE AUDIT SAMPLES

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

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

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATES

Are all RPD values within specification? Yes No N/A

Are there any calculation errors? Yes No N/A

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

6.2 FIELD DUPLICATE SAMPLES

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

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

6.3 FIELD SPLIT SAMPLES

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

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

7. SYSTEM PERFORMANCE

7.1 INTERNAL STANDARDS PERFORMANCE

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

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

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

8. COMPOUND IDENTIFICATION AND QUANTITATION

8.1 COMPOUND IDENTIFICATION

Are detected compounds within ±0.06 relative retention time units of the associated calibration standard?	Yes	No	N/A
Are all ions at a relative intensity of ≥10% in the standard spectra present in the sample spectra?	Yes	No	N/A
Do the relative intensities between the standard and sample spectra agree within 20%?	Yes	No	N/A
Have all ions > 10% in the sample spectra that are not present in the standard spectra been reviewed for possible background contamination?	Yes	No	N/A
Are molecular ions in the reference spectrum present in the sample spectrum?	Yes	No	N/A

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

8.2 REPORTED RESULTS AND QUANTITATION LIMITS

Has the laboratory used the correct RRF values and internal standards for quantitation?	Yes	No	N/A
Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

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

8.3 TENTATIVELY IDENTIFIED COMPOUNDS

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

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

9. OVERALL ASSESSMENT AND SUMMARY

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

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

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

9613402.1428

COMMENTS (attach additional sheets as necessary):

See attached for deficiencies

8/18/92

9613402.1429

SEP 1991
RECEIVED
DATA RECEIPT

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

DATE RECEIVED: 07/10/91 RFW LOT # :9107L114

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	Days	ANALYSIS	Days
BOOX59	001	S	91LE0886	07/08/91	07/15/91	7	07/18/91	3
BOOX59	001 MS	S	91LE0886	07/08/91	07/15/91	↓	07/18/91	↓
BOOX59	001 MSD	S	91LE0886	07/08/91	07/15/91	↓	07/18/91	↓

LAB QC:

SBLK	MB1	S	91LE0886	N/A	07/15/91	07/18/91
SBLK	MB1	S	91LE0886	N/A	07/15/91	07/23/91
SBLK	MB1 BS	S	91LE0886	N/A	07/15/91	07/18/91

Holding times met

5/12/92

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0000067

7B

SEMIVOLATILE CONTINUING CALIBRATION CHECK

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

Case No.: WESTINGHOUSE HANFORD RFW Lot: 9107L114

Instrument ID: 5100SP Calibration Date: 07/18/91 Time: 1743

Lab File ID: S071806 Init. Calib. Date(s): 07/11/91 07/11/91

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND		$\overline{RRF}$	RRF50	%D		Sample Qualifier
Phenol	*	1.757	1.585	9.8	*	
bis(2-Chloroethyl)ether		1.666	1.452	12.8		
2-Chlorophenol		1.318	1.211	8.1		
1,3-Dichlorobenzene		1.380	1.358	1.6		
1,4-Dichlorobenzene	*	1.584	1.492	5.8	*	
Benzyl alcohol		0.825	0.662	19.8		
1,2-Dichlorobenzene		1.455	1.339	8.0		
2-Methylphenol		1.310	1.116	14.8		
bis(2-Chloroisopropyl)ether		2.258	1.418	37.2		UJ
4-Methylphenol		1.363	1.145	16.0		
N-Nitroso-Di-n-propylamine	#	1.504	1.059	29.6	#	UJ
Hexachloroethane		0.909	0.719	20.9		
Nitrobenzene		0.487	0.446	8.4		
Isophorone		0.940	0.869	7.6		
2-Nitrophenol	*	0.166	0.175	-5.4	*	
2,4-Dimethylphenol		0.393	0.346	12.0		
Benzoic acid		0.159	0.137	13.8		
bis(2-Chloroethoxy)methane		0.484	0.497	-2.7		
2,4-Dichlorophenol	*	0.244	0.276	-13.1	*	
1,2,4-Trichlorobenzene		0.270	0.319	-18.1		
Naphthalene		0.916	1.016	-10.9		
4-Chloroaniline		0.392	0.376	4.1		
Hexachlorobutadiene	*	0.175	0.188	-7.4	*	
4-Chloro-3-methylphenol	*	0.364	0.329	9.6	*	
2-Methylnaphthalene		0.595	0.609	-2.4		
Hexachlorocyclopentadiene	#	0.092	0.120	-30.4	#	UJ
2,4,6-Trichlorophenol	*	0.241	0.281	-16.6	*	
2,4,5-Trichlorophenol		0.274	0.313	-14.2		
2-Chloronaphthalene		0.924	1.028	-11.3		
2-Nitroaniline		0.451	0.357	20.8		
Dimethylphthalate		1.118	1.178	-5.4		
Acenaphthylene		1.370	1.490	-8.8		
2,6-Dinitrotoluene		0.228	0.284	-24.6		
3-Nitroaniline		0.232	0.172	25.9		UJ
Acenaphthene	*	0.885	0.957	-8.1	*	
2,4-Dinitrophenol	#	0.085	0.088	-3.5	#	
4-Nitrophenol	#	0.221	C.169	23.5	#	

CH 8-5-91

FORM VII SV-1 5/88 Rev.

9613402.1431

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7C

SEMIVOLATILE CONTINUING CALIBRATION CHECK

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

Case No.: WESTINGHOUSE HANFORD RFW Lot: 9107L114

Instrument ID: 5100SP Calibration Date: 07/18/91 Time: 1743

Lab File ID: S071806 Init. Calib. Date(s): 07/11/91 07/11/91

Min RRF50 for SPCC(#) = 0.050 Max %D for CCC(*) = 25.0%

COMPOUND	RRF	RRF50	%D	Sample qualifier
Dibenzofuran	1.259	1.419	-12.7	
2,4-Dinitrotoluene	0.322	0.342	-6.2	
Diethylphthalate	1.335	1.316	1.4	
4-Chlorophenyl-phenylether	0.496	0.649	-30.8	UJ
Fluorene	0.963	1.093	-13.5	
4-Nitroaniline	0.178	0.153	14.0	
4,6-Dinitro-2-methylphenol	0.091	0.095	-4.4	
N-Nitrosodiphenylamine (1) *	0.478	0.540	-13.0 *	
4-Bromophenyl-phenylether	0.186	0.218	-17.2	
Hexachlorobenzene	0.210	0.240	-14.3	
Pentachlorophenol *	0.115	0.109	5.2 *	
Phenanthrene	0.975	1.053	-8.0	
Anthracene	1.039	1.063	-2.3	
Di-n-Butylphthalate	1.632	1.383	15.3	
Fluoranthene *	1.195	1.142	4.4 *	
Pyrene	1.305	1.331	-2.0	
Butylbenzylphthalate	0.942	0.820	13.0	
3,3'-Dichlorobenzidine	0.256	0.183	-28.5	UJ
Benzo(a)anthracene	1.034	1.092	-5.6	
Chrysene	1.081	1.094	-1.2	
bis(2-Ethylhexyl)phthalate	1.152	1.162	-0.9	
Di-n-Octyl phthalate *	2.235	2.277	-1.9 *	
Benzo(b)fluoranthene	1.156	1.411	-22.1	
Benzo(k)fluoranthene	1.051	1.011	3.8	
Benzo(a)pyrene *	0.950	1.029	-8.3 *	
Indeno(1,2,3-cd)pyrene	0.868	0.919	-5.9	
Dibenzo(a,h)anthracene	0.739	0.759	-2.7	
Benzo(g,h,i)perylene	0.823	0.846	-2.8	
Nitrobenzene-d5	0.539	0.490	9.1	
2-Fluorobiphenyl	0.924	1.026	-11.0	
p-Terphenyl-d14	0.841	0.938	-11.5	
Phenol-d5	1.594	1.447	9.2	
2-Fluorophenol	1.159	1.258	-8.5	
2,4,6-Tribromophenol	0.122	0.125	-2.5	

(1) Cannot be separated from Diphenylamine

[illegible] 5/18/92

9613402.1432

1B 0000120

SEMIVOLATILE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

SBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL Lab Sample ID: 91LE0886-MB1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S071807

Level: (low/med) LOW Date Received: 07/15/91

% Moisture: not dec. 0 dec. Date Extracted: 07/15/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/18/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

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

CAS NO.	COMPOUND		
108-95-2	Phenol	330	U
111-44-4	bis(2-Chloroethyl)ether	330	U
95-57-8	2-Chlorophenol	330	U
541-73-1	1,3-Dichlorobenzene	330	U
106-46-7	1,4-Dichlorobenzene	330	U
100-51-6	Benzyl alcohol	330	U
95-50-1	1,2-Dichlorobenzene	330	U
95-48-7	2-Methylphenol	330	U
108-60-1	bis(2-Chloroisopropyl)ether	330	U
106-44-5	4-Methylphenol	330	U
621-64-7	N-Nitroso-Di-n-propylamine	330	U
67-72-1	Hexachloroethane	330	U
98-95-3	Nitrobenzene	330	U
78-59-1	Isophorone	330	U
88-75-5	2-Nitrophenol	330	U
105-67-9	2,4-Dimethylphenol	330	U
65-85-0	Benzoic acid	1700	U
111-91-1	bis(2-Chloroethoxy)methane	330	U
120-83-2	2,4-Dichlorophenol	330	U
120-82-1	1,2,4-Trichlorobenzene	330	U
91-20-3	Naphthalene	330	U
106-47-8	4-Chloroaniline	330	U
87-68-3	Hexachlorobutadiene	330	U
59-50-7	4-Chloro-3-methylphenol	330	U
91-57-6	2-Methylnaphthalene	330	U
77-47-4	Hexachlorocyclopentadiene	330	U
88-06-2	2,4,6-Trichlorophenol	330	U
95-95-4	2,4,5-Trichlorophenol	1700	U
91-58-7	2-Chloronaphthalene	330	U
88-74-4	2-Nitroaniline	1700	U
131-11-3	Dimethylphthalate	330	U
208-96-8	Acenaphthylene	330	U
606-20-2	2,6-Dinitrotoluene	330	U

MW 5/12/92

9613402.1433 0000127

SEMIVOLATILE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

SBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL Lab Sample ID: 91LE0886-MB1

Sample wt/vol: 30.0 (g/mL) G Lab File ID: S071807

Level: (low/med) LOW Date Received: 07/15/91

% Moisture: not dec. 0 dec. Date Extracted: 07/15/91

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 07/18/91

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

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

CAS NO.	COMPOUND		
99-09-2	3-Nitroaniline	1700	U
83-32-9	Acenaphthene	330	U
51-28-5	2,4-Dinitrophenol	1700	U
100-02-7	4-Nitrophenol	1700	U
132-64-9	Dibenzofuran	330	U
121-14-2	2,4-Dinitrotoluene	330	U
84-66-2	Diethylphthalate	330	U
7005-72-3	4-Chlorophenyl-phenylether	330	U
86-73-7	Fluorene	330	U
100-01-6	4-Nitroaniline	1700	U
534-52-1	4,6-Dinitro-2-methylphenol	1700	U
86-30-6	N-Nitrosodiphenylamine (1)	330	U
101-55-3	4-Bromophenyl-phenylether	330	U
118-74-1	Hexachlorobenzene	330	U
87-86-5	Pentachlorophenol	1700	U
85-01-8	Phenanthrene	330	U
120-12-7	Anthracene	330	U
84-74-2	Di-n-Butylphthalate	39	J
206-44-0	Fluoranthene	330	U
129-00-0	Pyrene	330	U
85-68-7	Butylbenzylphthalate	330	U
91-94-1	3,3'-Dichlorobenzidine	670	U
56-55-3	Benzo(a)anthracene	330	U
218-01-9	Chrysene	330	U
117-81-7	bis(2-Ethylhexyl)phthalate	330	U
117-84-0	Di-n-Octyl phthalate	330	U
205-99-2	Benzo(b)fluoranthene	330	U
207-08-9	Benzo(k)fluoranthene	330	U
50-32-8	Benzo(a)pyrene	330	U
193-39-5	Indeno(1,2,3-cd)pyrene	330	U
53-70-3	Dibenzo(a,h)anthracene	330	U
191-24-2	Benzo(g,h,i)perylene	330	U

x10 = 390

5/12/92

(1) - Cannot be separated from Diphenylamine

FORM 1 SV-2 12/88 Rev.

9613402.1434

1F 0000120

SEMIVOLATILE ORGANICS ANALYSIS SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

CLIENT SAMPLE NO.

SBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL

Lab Sample ID: 91LE0886-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: S071807

Level: (low/med) LOW

Date Received: 07/15/91

% Moisture: not dec. 0 dec.

Date Extracted: 07/15/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 07/18/91

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

Dilution Factor: 1.00

Number TICs found: 0

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

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

5/12/92

3D

SOIL SEMIVOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

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

Case No.: WESTINGHOUSE HANFORD RFW Lot No.: 9107L114-001

MATRIX Spike - Sample No.: BOOX59 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	MS CONCENTRATION (ug/Kg)	MS % REC #	QC LIMITS REC
Phenol	3410	0	2650	78	26- 90
2-Chlorophenol	3410	0	3030	89	25-102
1,4-Dichlorobenzene	1700	0	1370	81	28-104
N-Nitroso-Di-n-propylamine	1700	0	1250	73	41-126
1,2,4-Trichlorobenzene	1700	0	1470	87	38-107
4-Chloro-3-methylphenol	3410	0	3110	91	26-103
Acenaphthene	1700	0	1500	88	31-137
4-Nitrophenol	3410	0	3160	93	11-114
2,4-Dinitrotoluene	1700	0	1490	87	28- 89
Pentachlorophenol	3410	0	3780	111 *	17-109
Pyrene	1700	0	1630	96	35-142

COMPOUND	SPIKE ADDED (ug/Kg)	MSD CONCENTRATION (ug/Kg)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC
Phenol	3370	2710	81	3	35	26- 90
2-Chlorophenol	3370	3160	94	5	50	25-102
1,4-Dichlorobenzene	1680	1440	85	4	27	28-104
N-Nitroso-Di-n-propylamine	1680	1310	78	6	38	41-126
1,2,4-Trichlorobenzene	1680	1540	92	5	23	38-107
4-Chloro-3-methylphenol	3370	3210	95	4	33	26-103
Acenaphthene	1680	1580	94	6	19	31-137
4-Nitrophenol	3370	3500	104	11	50	11-114
2,4-Dinitrotoluene	1680	1610	95 *	8	47	28- 89
Pentachlorophenol	3370	3930	117 *	5	47	17-109
Pyrene	1680	1680	99	3	36	35-142

Column to be used to flag recovery and RPD values with an asterisk
* Values outside of QC limits

RPD: 0 out of 11 outside limits
Spike Recovery: 3 out of 22 outside limits

5/12/92

COMMENTS:

3D

SOIL SEMIVOLATILE BLANK SPIKE RECOVERY

Lab Name: Roy F. Weston, Inc. Contract: NONE

Case No.: WESTINGHOUSE HANFORD RFW Lot No.: 9107L114

BLANK Spike - Sample No.: SBLKLE0886-MB1 Level:(low/med) LOW

COMPOUND	SPIKE ADDED (ug/Kg)	SAMPLE CONCENTRATION (ug/Kg)	BS CONCENTRATION (ug/Kg)	BS % REC #	QC LIMITS REC
Phenol	3330	0	2800	84	26- 90
2-Chlorophenol	3330	0	3020	91	25-102
1,4-Dichlorobenzene	1660	0	1370	82	28-104
N-Nitroso-Di-n-propylamine	1660	0	1350	81	41-126
1,2,4-Trichlorobenzene	1660	0	1500	90	38-107
4-Chloro-3-methylphenol	3330	0	3140	94	26-103
Acenaphthene	1660	0	1600	96	31-137
4-Nitrophenol	3330	0	3490	105	11-114
2,4-Dinitrotoluene	1660	0	1590	95	28- 89
Pentachlorophenol	3330	0	3790	114 *	17-109
Pyrene	1660	0	1480	89	35-142

Column to be used to flag recovery value with an asterisk
* Values outside of QC limits

Spike Recovery: 2 out of 11 outside limits

COMMENTS:

5/12/92

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

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

Case No.: WESTINGHOUSE HANFORD RFW Lot: 9107L114

Lab File ID (Standard): S071806 Date Analyzed: 07/18/91

Instrument ID: 5100SP Time Analyzed: 1743

		IS1(DCB) AREA #	RT	IS2(NPT) AREA #	RT	IS3(ANT) AREA #	RT
	12 HOUR STD	49885	6.32	183076	9.17	116607	13.53
	UPPER LIMIT	99770	6.82	366152	9.67	233214	14.03
	LOWER LIMIT	24943	5.82	91538	8.67	58304	13.03
	CLIENT SAMPLE NO.						
01	BOOX59	90744	6.30	278153	9.15	157276	13.53
02	BOOX59MS	97082	6.28	277114	9.15	165895	13.53
03	BOOX59MSD	104185*	6.30	285011	9.15	158332	13.53
04	SBLKLE0886-MB1	223545*	6.28	341747	9.12	187762	13.50
05	SBLKLE0886-MB1 BS	88483	6.30	262843	9.15	143549	13.53

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

Mel Stirler

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

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

Case No.: WESTINGHOUSE HANFORD RFW Lot: 9107L114

Lab File ID (Standard): S071806 Date Analyzed: 07/18/91

Instrument ID: 5100SP Time Analyzed: 1743

		IS4(PHN) AREA #	RT	IS5(CRY) AREA #	RT	IS6(PRY) AREA #	RT
	12 HOUR STD	175419	17.27	148407	22.45	119940	26.05
	UPPER LIMIT	350838	17.77	296814	22.95	239880	26.55
	LOWER LIMIT	87710	16.77	74204	21.95	59970	25.55
	CLIENT SAMPLE NO.						
01	BOOX59	248097	17.27	190517	22.40	143089	26.00
02	BOOX59MS	246226	17.25	194099	22.50	156438	26.12
03	BOOX59MSD	232751	17.27	186106	22.20	143886	25.75
04	SBLKLE0886-MB1	248136	17.23	221473	22.25	184514	25.80
05	SBLKLE0886-MB1 BS	204113	17.27	178955	22.37	144909	25.95

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

5/12/92

8B

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

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

Case No.: WESTINGHOUSE HANFORD RFW Lot: 9107L114

Lab File ID (Standard): S072210 Date Analyzed: 07/23/91

Instrument ID: 5100SP Time Analyzed: 0051

		IS1(DCB) AREA #	RT	IS2(NPT) AREA #	RT	IS3(ANT) AREA #	RT
	12 HOUR STD	29147	6.65	107513	9.53	68698	13.95
	UPPER LIMIT	58294	7.15	215026	10.03	137396	14.45
	LOWER LIMIT	14574	6.15	53757	9.03	34349	13.45
	CLIENT SAMPLE NO.						
01	SBLKLE0886-MB1 RE	22824	6.63	86220	9.53	47155	13.97

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

5/12/92

9613402.1440 0000110

8C

SEMIVOLATILE INTERNAL STANDARD AREA SUMMARY

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

Case No.: WESTINGHOUSE HANFORD RFW Lot: 9107L114

Lab File ID (Standard): S072210 Date Analyzed: 07/23/91

Instrument ID: 5100SP Time Analyzed: 0051

		IS4(PHN) AREA #	RT	IS5(CRY) AREA #	RT	IS6(PRY) AREA #	RT
	12 HOUR STD	98447	17.70	68686	22.77	52371	26.75
	UPPER LIMIT	196894	18.20	137372	23.27	104742	27.25
	LOWER LIMIT	49224	17.20	34343	22.27	26186	26.25
	CLIENT SAMPLE NO.						
01	SBLKLE0886-MB1 RE	59105	17.70	33506*	22.93	21238*	26.95

IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

UPPER LIMIT = + 100% of internal standard area.
LOWER LIMIT = - 50% of internal standard area.

Column used to flag internal standard area values with an asterisk

5/12/91

PESTICIDE/PCB DATA VALIDATION CHECKLIST - FORM A-3

PROJECT: 200BP1	REVIEWER: KMA	DATE: 5/12/92
LABORATORY: Weston	CASE: ——	SDG: 9107414
SAMPLES/MATRIX:		
B00X59 Soil		

1. DATA PACKAGE COMPLETENESS

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

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓	—	—
Data Summary	✓	—	—
Chain-of-Custody	✓	—	—
QC Summary			
Surrogate report	✓	—	—
MS/MSD report	✓	—	—
Blank summary report	✓	—	—
Sample Data			
Sample reports	✓	—	—
Chromatograms	✓	—	—
GC integration reports	✓	—	—
Worksheets	—	✓	—
UV traces from GPC	—	✓	—
GC/MS confirmation spectra	—	✓	—
Standards Data			
Pesticides Evaluation Standards Summary	✓	—	—
Pesticides/PCB Standards Summary	✓	—	—
Pesticides/PCB identification	✓	—	—
Pesticides standard chromatograms	✓	—	—
Raw QC Data			
Blank analysis report forms and chromatograms	✓	—	—
MS/MSD report forms and chromatograms	✓	—	—

Data Package Item	Present?: Yes	No	N/A
Additional Data			
Moisture/% solids data sheets	✓		
Reduction formulae		✓	
Instrument time logs		✓	
Chemist notebook pages		✓	
Sample preparation sheets	✓		

2. HOLDING TIMES

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

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

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

3. INSTRUMENT PERFORMANCE AND CALIBRATIONS

3.1 INSTRUMENT PERFORMANCE (2/88 SOW)

Are DDT retention times greater than 12 minutes? **(Yes)** No N/A

ACTION: If DDT retention time is $\leq$12 minutes and resolution is <25% qualify associated data as unusable (R).

Is resolution between DDT peaks acceptable? **(Yes)** No N/A

ACTION: If resolution between DDT peaks is unacceptable qualify associated data as unusable (R).

Do all pesticide standards elute within the established retention time windows? **(Yes)** No N/A

ACTION: If the standards do not meet the retention time criteria and peaks are not present near or within the retention time windows no sample qualification is necessary. If peaks are near or within the retention time windows and the standards and matrix spikes do not fall within the expanded retention time windows calculated according to the validation requirements, qualify all associated sample results from the last in-control point as unusable (R).

Are DDT breakdowns $\leq$20%? **(Yes)** No N/A

ACTION: If the DDT percent breakdown exceeds 20%, qualify all detected results for DDT as estimated (J) and all nondetects as unusable (R) if DDD and DDE are detected. In addition qualify all results for DDD or DDE as presumptive and estimated (NJ).

Are endrin breakdowns $\leq$20%? **(Yes)** No N/A

ACTION: If the endrin breakdown exceeds 20%, qualify all detected results for endrin as estimated (J) and all nondetects as unusable (R) if endrin aldehyde or endrin ketone are detected. In addition, qualify all results for endrin ketone as presumptive and estimated (NJ).

Are DBC retention time differences within specification? Yes No N/A

ACTION: If DBC %D values are outside the limits and the shift is ocurring repeatedly in samples and standards, qualify affected sample results as unusable (R).

3.2 CALIBRATIONS (2/88 SOW)

Are RSD values for aldrin, endrin, DDT and DBC ≤10%? Yes No N/A

Have all standards been analyzed within 72 h of any sample? Yes No N/A

Has a 3-point calibration been conducted for DDT or toxaphene? Yes No N/A

Have all standards been analyzed at the start of each 72-h sequence? Yes No N/A

Have evaluation standards A, B, and C been analyzed within 72 h of any sample? Yes No N/A

Has the confirmation standard mix been analyzed after every five samples? Yes No N/A

Has evaluation standard B analyzed every 10 samples? Yes No N/A

Are %D values for initial and subsequent standards ≤15% for quantitation standards and ≤20% for confirmation standards? Yes No N/A

ACTION: If the RSD criteria were exceeded or three point calibrations not conducted qualify associated detects as estimated (J). If all standards were not analyzed at the beginning of each 72-h sequence qualify associated data as unusable (R). If the confirmation standards were not analyzed properly qualify associated detects as estimated (J). If the continuing calibration criteria were not met qualify associated quantitation data as estimated (J).

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

Is peak resolution acceptable? Yes No N/A

ACTION: If the resolution criteria are not met, reject positive sample results generated after initial calibration (R).

Are DDT and endrin breakdowns ≤20.0% Yes No N/A

ACTION: If the breakdown criteria are not met qualify sample results as described in Section 5.3.1 of the validation requirements.

Are single component target compounds in the PEMs, INDA, INDB and the calibration standards within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the retention time window a review is made of the raw data to determine expanded retention time windows (see Section 5.3.1 of the validation requirements). If all standards and matrix spikes fall within the expanded windows then no qualification of sample results is necessary. If all standards and matrix spikes do not fall within the expanded windows then all affected sample results are qualified as unusable (R).

Are the RPDs acceptable for the PEMs? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are the RSDs for the calibration factors <10.0% (<15.0% for the BHC series, DDT, endrin, and methoxychlor)? Yes No N/A

ACTION: If the RSD criteria are not met qualify associated positive sample results as estimated (J).

3.4 CALIBRATION VERIFICATION (3/90 SOW)

Have the analytical sequence requirements been met for the analysis of instrument blanks, PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the analytical sequence requirements are not followed and any of the resolution or retention time criteria listed below are exceeded, reject associated positive results (R).

Is peak resolution acceptable for PEMs, INDA and INDB mixes? Yes No N/A

ACTION: If the resolution criteria are not met reject positive sample results generated after a noncompliant standard analysis (R).

Are single component target compounds in the PEMs, INDA and INDB mixes within the retention time windows? Yes No N/A

ACTION: If the retention time criteria are not met and no peaks are present in the samples analyzed after the noncompliant standard within two times the retention time windows (±0.04, ±0.05 for methoxychlor), no qualification is necessary. If peaks are present in samples within the expanded windows rejected associated positive and nondetect results (R).

Are RPDs between the calculated and true amounts in the PEMs, INDA and INDB mixes ≤25.0%? Yes No N/A

ACTION: If the RPD criteria are not met qualify associated positive sample results as estimated (J).

Are DDT and endrin breakdowns in the PEMs ≤20.0% (≤30.0% total combined)? Yes No N/A

ACTION: If the breakdown criteria are not met qualify associated positive sample results in accordance with the criteria specified in Section 5.3.1.

4. BLANKS

4.1 LABORATORY BLANKS

Has the laboratory analyzed the method blanks at the required frequency? Yes No N/A

Has the laboratory analyzed a sulfur clean-up blank if required? Yes No N/A

Has the laboratory analyzed instrument blanks at the required frequency? Yes No N/A 5/12/92

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

ACTION: Qualify all associated positive results as nondetects (U) that are <5 times the highest concentration in any acceptable blank.

4.2 FIELD BLANKS

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

ACTION: If target compounds are present in the field blanks qualify all positive sample results <5 times the highest valid field blank concentrations as nondetects (U) and note the results in the validation narrative.

5. ACCURACY

5.1 SURROGATE RECOVERY

Are any surrogate recoveries out of specification?	Yes	No	N/A
Do any samples show nondetects for surrogates?	Yes	No	N/A
Are any method blank surrogates out of specification?	Yes	No	N/A

ACTION: Qualify all associated sample results as estimated (J for detects and UJ for nondetects) for surrogates out of specification. If the surrogate was not detected (0% recovery) in the sample qualify associated nondetects as unusable (R). If method blank surrogates are out of specification and sample surrogates are acceptable, no qualification is required however, the laboratory should be contacted for an explanation.

5.2 MATRIX SPIKE RECOVERY

Has the laboratory analyzed a MS/MSD per matrix for the the sample group?	Yes	No	N/A
Are MS/MSD recoveries within specification?	Yes	No	N/A
Are there any calculation or transcription errors?	Yes	No	N/A

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

5.3 PERFORMANCE AUDIT SAMPLES

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

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

6. PRECISION

6.1 MATRIX SPIKE/MATRIX SPIKE DUPLICATE SAMPLES

Are the RPD values within specification? Yes No N/A

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

6.2 FIELD DUPLICATE SAMPLES

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

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

6.3 FIELD SPLIT SAMPLES

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

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

7. COMPOUND IDENTIFICATION AND QUANTITATION

7.1 COMPOUND IDENTIFICATION

Do positive results meet the retention time window criteria? -Yes No N/A

Were positive results analyzed on disimilar columns? Yes No N/A

If dieldrin and DDE were reported was a 3% OV-1 column used for confirmation (2/88 SOW data only)? Yes No N/A

Do retention times and relative peak height ratios match the expected patterns for multipeak compounds (PCB, toxaphene or chlordane)? Yes No N/A

Has GC/MS confirmation been conducted on sample extract concentrations > 10 ppm? Yes No N/A

ACTION: If positive results do not meet the retention time criteria qualify all detected results as nondetects as follows: If the misidentified peak is outside the retention time windows and no interferences are noted report the CRQL and if the misidentified peak interferes with a target peak then the report value is qualified as estimated and nondetected (UJ). If positive results were not confirmed on disimilar columns, reject affected results (R). If a 3% OV-1 was used to confirm dieldrin and DDE, reject the affected data (R). If PCB, chlordane or toxaphene identification is questionable qualify the results as presumptive and estimated (NJ). If GC/MS confirmation was not conducted contact the laboratory for explanation and note in the validation narrative.

7.2 REPORTED RESULTS AND QUANTITATION LIMITS

Are results and quantitation limits calculated properly?	Yes	No	N/A
Has the laboratory reported the sample quantitation limits within 5xCRQL values?	Yes	No	N/A

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

8. OVERALL ASSESSMENT AND SUMMARY

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

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

See attached for deficiencies

MWB
5/12/91

9613402.1450

SEP 1991
RECEIVED
DATA RECEIPT

Roy F. Weston, Inc. - Lionville Laboratory
PEST/PCB ANALYTICAL DATA PACKAGE FOR
WESTINGHOUSE HANFORD

DATE RECEIVED: 07/10/91 RFW LOT # :9107L114

CLIENT ID	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	Days	ANALYSIS	Days
BOOX59	001	S	91LE0895	07/08/91	07/17/91	9	08/13/91	24
BOOX59	001 MS	S	91LE0895	07/08/91	07/17/91	↓	08/14/91	28
BOOX59	001 MSD	S	91LE0895	07/08/91	07/17/91	↓	08/14/91	↓

LAB QC:

PBLK -	MB1	S	91LE0895	N/A	07/17/91	08/13/91
PBLK	MB1 BS	S	91LE0895	N/A	07/17/91	08/13/91

Extract. Holding time exceeded by 2 days all results qualified as estimated (UJ)
MVT
5/12/92

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8D

PESTICIDE EVALUATION STANDARD SUMMARY

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

Case No.: WESTINGHOUSE HANFORD GC Sample ID: 08129114

RFW Lot No.: 9107L114

Instrument ID: 14 GC Column ID: SP2100

Dates of Analyses: 08/12/91 to 08/13/91

Evaluation Check for Linearity

PESTICIDE	CALIBRATION FACTOR EVAL MIX A	CALIBRATION FACTOR EVAL MIX B	CALIBRATION FACTOR EVAL MIX C	%RSD (</= 10.0%)
ALDRIN	3746325	4329233	5105513	15.5
ENDRIN	1446545	1569623	1719651	8.7
4,4'-DDT	550975	700187	858058	21.8 (1)
DBC	665096	695797	734435	5.0

(1) If > 10.0% RSD, plot a standard curve and determine the ng for each sample in that set from the curve.

Evaluation Check for 4,4'-DDT/Endrin Breakdown
(percent breakdown expressed as total degradation)

		DATE ANALYZED	TIME ANALYZED	ENDRIN	4,4'-DDT	COMBINED (2)
01	INIT. EVAL MIX B	08/12/91	1423			5.2
02	EVAL MIX B	08/13/91	0013			4.4
03	EVAL MIX B	08/13/91	0856			4.8
04	EVAL MIX B	08/13/91	2218			3.1

(2) See Form Instructions.

5/12/92

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9

PESTICIDE/PCB STANDARD SUMMARY

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

Case No.: WESTINGHOUSE HANFORD GC Sample ID: 08129113.43

RFW Lot No.: 9107L114

Instrument ID: 13 GC Column ID: 2250/2401

DATE(S) OF ANALYSIS FROM: 08/12/91 TO: 08/12/91
TIME(S) OF ANALYSIS FROM: 1525 TO: 1949

DATE OF ANALYSIS 08/13/91
TIME OF ANALYSIS 1622
EPA SAMPLE NO. (STANDARD) INDB 26-56

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
Alpha-BHC	1.94	1.93	1.95	9454363	1.94	9657737	Y	2.2
Beta-BHC	2.68	2.66	2.70	5625347	2.68	5418803	Y	3.7
Delta-BHC	3.11	3.09	3.13	4644071	3.11	4653611	Y	0.2
gamma-BHC (Lindane)	2.40	2.39	2.41	8944055				
Heptachlor	2.92	2.91	2.93	9741205				
Aldrin	3.50	3.43	3.57	6786657	3.50	6870739	Y	1.2
Heptachlor epoxide	5.02	5.00	5.04	5450551				
Endosulfan I	6.25	6.23	6.27	3854439				
Dieldrin	7.55	7.52	7.58	2990101				
4,4'-DDE	7.07	7.02	7.12	2860445	7.08	2820703	Y	1.4
Endrin	9.11	9.02	9.20	1427259	9.12	1752049	Y	22.8
Endosulfan II	10.88	10.83	10.93	2160043				
4,4'-DDD	10.51	10.43	10.59	1456171	10.52	1467437	Y	0.8
Endosulfan sulfate	16.37	16.07	16.67	1203587	16.38	1255769	Y	4.3
4,4'-DDT	12.62	12.56	12.66	1252089				
Methoxychlor	23.32	23.02	23.62	587803				
Endrin ketone	******	******	******	COELUTES *				
alpha-Chlordane	6.05	6.00	6.10	3897247	6.05	3768935	Y	3.3
gamma-Chlordane	5.57	5.53	5.61	4271617	5.58	4143293	Y	3.0
Toxaphene	11.08	10.98	11.18	289224				
Aroclor-1016	2.87	2.84	2.90	1918595				
Aroclor-1221	1.82	1.81	1.83	605132				
Aroclor-1232	2.87	2.85	2.89	966522				
Aroclor-1242	2.87	2.86	2.88	1634783				
Aroclor-1248	2.87	2.84	2.90	1888567				
Aroclor-1254	8.80	8.79	8.81	1472301				
Aroclor-1260	9.82	9.72	9.92	1044775				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.
%D must be less than or equal to 15.0% for quantitation, and less than or equal to 20.0% for confirmation.

5/12/92

Note: Determining that no compounds were found above the CRQL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

9613402.1453

0000029

9

PESTICIDE/PCB STANDARD SUMMARY

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

Case No.: WESTINGHOUSE HANFORD GC Sample ID: 08129113.62

RFW Lot No.: 9107L114

Instrument ID: 13 GC Column ID: 2250/2401

DATE(S) OF ANALYSIS FROM: 08/12/91 TO: 08/12/91
TIME(S) OF ANALYSIS FROM: 1525 TO: 1949

DATE OF ANALYSIS 08/14/91
TIME OF ANALYSIS 1251
EPA SAMPLE NO. (STANDARD) INDB 26-56

COMPOUND	RT	RT WINDOW FROM	RT WINDOW TO	CALIBRATION FACTOR	RT	CALIBRATION FACTOR	QNT Y/N	%D
Alpha-BHC	1.94	1.93	1.95	9454363	1.94	9950753	Y	5.3
Beta-BHC	2.68	2.66	2.70	5625347	2.68	5545609	Y	1.4
Delta-BHC	3.11	3.09	3.13	4644071	3.11	4717877	Y	1.6
gamma-BHC (Lindane)	2.40	2.39	2.41	8944055				
Heptachlor	2.92	2.91	2.93	9741205				
Aldrin	3.50	3.43	3.57	6786657	3.50	7054173	Y	3.9
Heptachlor epoxide	5.02	5.00	5.04	5450551				
Endosulfan I	6.25	6.23	6.27	3854439				
Dieldrin	7.55	7.52	7.58	2990101				
4,4'-DDE	7.07	7.02	7.12	2860445	7.07	2904539	Y	1.5
Endrin	9.11	9.02	9.20	1427259	9.11	1709941	Y	19.8
Endosulfan II	10.88	10.83	10.93	2160043				
4,4'-DDD	10.51	10.43	10.59	1456171	10.51	1501663	Y	3.1
Endosulfan sulfate	16.37	16.07	16.67	1203587	16.35	1287745	Y	7.0
4,4'-DDT	12.62	12.56	12.66	1252089				
Methoxychlor	23.32	23.02	23.62	587803				
Endrin ketone	******	******	******	COELUTES *				
alpha-Chlordane	6.05	6.00	6.10	3897247	6.05	3906145	Y	0.2
gamma-Chlordane	5.57	5.53	5.61	4271617	5.57	4259147	Y	0.3
Toxaphene	11.08	10.98	11.18	289224				
Aroclor-1016	2.87	2.84	2.90	1918595				
Aroclor-1221	1.82	1.81	1.83	605132				
Aroclor-1232	2.87	2.85	2.89	966522				
Aroclor-1242	2.87	2.86	2.88	1634783				
Aroclor-1248	2.87	2.84	2.90	1888567				
Aroclor-1254	8.80	8.79	8.81	1472301				
Aroclor-1260	9.82	9.72	9.92	1044775				

Under QNT Y/N: enter Y if quantitation was performed, N if not performed.
%D must be less than or equal to 15.0% for quantitation, and less than or equal to 20.0% for confirmation.

5/12/92

Note: Determining that no compounds were found above the CRQL is a form of quantitation, and therefore at least one column must meet the 15.0% criteria.

For multicomponent analytes, the single largest peak that is characteristic of the component should be used to establish retention time and %D. Identification of such analytes is based primarily on pattern recognition.

9613402.1454 0000138

PESTICIDE ORGANICS ANALYSIS SHEET

CLIENT SAMPLE NO.

PBLK

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

Client: WESTINGHOUSE HANFORD

Matrix: SOIL

Lab Sample ID: 91LE0895-MB1

Sample wt/vol: 30.0 (g/mL) G

Lab File ID: 08129113.46

Level: (low/med) LOW

Date Received: 07/17/91

% Moisture: not dec. 0 dec.

Date Extracted: 07/17/91

Extraction: (SepF/Cont/Sonc) SONC

Date Analyzed: 08/13/91

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

Dilution Factor: 1.00

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

CAS NO.	COMPOUND		
319-84-6	Alpha-BHC	8.0	U
319-85-7	Beta-BHC	8.0	U
319-86-8	Delta-BHC	8.0	U
58-89-9	gamma-BHC (Lindane)	8.0	U
76-44-8	Heptachlor	8.0	U
309-00-2	Aldrin	8.0	U
1024-57-3	Heptachlor epoxide	8.0	U
959-98-8	Endosulfan I	8.0	U
60-57-1	Dieldrin	16	U
72-55-9	4,4'-DDE	16	U
72-20-8	Endrin	16	U
33213-65-9	Endosulfan II	16	U
72-54-8	4,4'-DDD	16	U
1031-07-8	Endosulfan sulfate	16	U
50-29-3	4,4'-DDT	~~16~~ 0.7	~~U~~ J
72-43-5	Methoxychlor	80	U
53494-70-5	Endrin ketone	16	U
5103-71-9	alpha-Chlordane	80	U
5103-74-2	gamma-Chlordane	80	U
8001-35-2	Toxaphene	160	U
12674-11-2	Aroclor-1016	80	U
11104-28-2	Aroclor-1221	80	U
11141-16-5	Aroclor-1232	80	U
53469-21-9	Aroclor-1242	80	U
12672-29-6	Aroclor-1248	80	U
11097-69-1	Aroclor-1254	160	U
11096-82-5	Aroclor-1260	160	U

8/16/91

J x 5 = 33

5/12/92

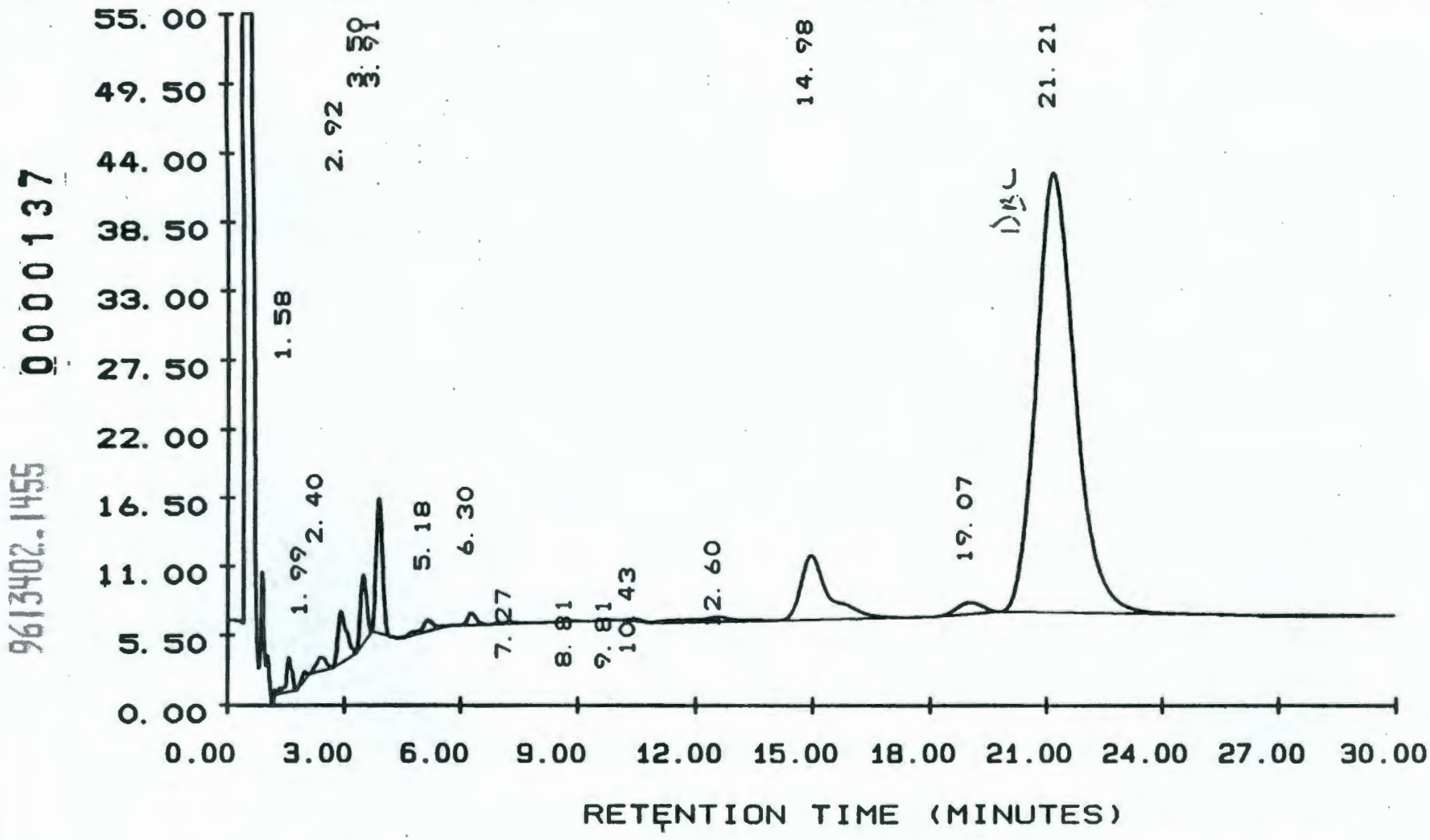
FORM 1 PEST 12/88 Rev.

91LE0895-MB1

SAMPLE NO. : 08129113 .46 INSTRUMENT: 13

TEST NO. : DATE TIME: 08/13/91 19:33:10

METHOD NO. : 13 / 13 PAGE NO. : 01



Y MAXIMUM: 54446. START TIME: 0.00

Y MINIMUM: 530. END TIME: 30.00

9613402.1455 0000137

9613402.1456 0000136

Roy F. Weston, Inc. - Lionville Laboratory 08/13/91 20:03:47

EXTERNAL STANDARD

SAMPLE: 08129113 .46 INST:13 VIAL:F0 SEQ NUMBER:046
TEST : 0608H DATE-TIME INJECTED : 08/13/91 19:33:10
COLLECTION TIME : 29.98 DATE-TIME PROCESSED : 08/13/91 20:03:47
METHOD: 13 / 13 REV #: 00129 ANALYST: BARKER SAMP RATE: 0.78
CLIENT ID: PBLK SAMPLE VOL: 3.0 ul
CLIENT: LAB COLUMN TYPE: 2250/2401
LAB ID: 91LE0895-MB1 * : CONFIRMED ON COLUMN
SAMPLE WT : % MOISTURE : DILUTION FACTOR : 1.0000

PK NO	PEAK AREA	PEAK HEIGHT	BL	RT MINUTES	GR #	COMPONENT NAME	HEIGHT CONC NG/UL	
001	283386	25065	V	1.578				
				1.943	1	ALPHA-BHC		
002	54761	5018	V	1.995				
003	196655	10753	V	2.399	1	GAMMA-BHC	0.000	
				2.676	1	BETA-BHC		
004	623994	39869	V	2.920	1	HEPTACHLOR	0.001	
				3.108	1	DELTA-BHC		
005	577441	51924	V	3.503	1	ALDRIN	0.003	
006	1194763	105082	V	3.908				
				5.025	1	HEPT. EPOXIDE		
007	205803	8584	V	5.177				
				5.569	1	G. CHLORDANE		
				6.047	1	A. CHLORDANE		
008	176851	9773	V	6.299	1	ENDOSULFAN I	0.001	
				7.070	1	4,4'-DDE		
009	60596	1691	V	7.274				
				7.549	1	DIELDRIN		
010	24788	1040	V	8.805				
				9.110	1	ENDRIN		
011	20759	923	V	9.813				
012	45974	1937	V	10.425	1	4,4'-DDD	0.000	
				10.877	1	ENDOSULFAN II		
013	315919	4050	V	12.599	1	4,4'-DDT	0.001	*
				13.860	1	ENDRIN ALDEHYDE		
014	2548723	50143	V	14.985				
				16.369	1	ENDO. SULFATE		
015	429414	9135	V	19.068				
016	24123024	344462		21.214	1	DBC	0.125	*
				23.320	1	METHOXYCHLOR		

x660.7 = 0.7
~~x660.7 = 0.7~~

5/18/92

INORGANIC ANALYSIS DATA VALIDATION CHECKLIST - FORM A-6

PROJECT: 200 BP1	REVIEWER: KAA	DATE: 5/12/92
LABORATORY: Weston	CASE:	SDG: 9107L114
SAMPLES/MATRIX:		
B00X59 Soil		

1. COMPLETENESS AND CONTRACT COMPLIANCE

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

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓		
Cover Page	✓		
Traffic Reports	✓		
Sample Data			
Inorganic Analysis Data Sheets	✓		
Standards Data			
Initial and Continuing Calibration Verification	✓		
CRDL Standard for AA and ICP	✓		
QC Summary			
Blanks	✓		
ICP Interference Check Summary	✓		
Spike Sample Recovery	✓		
Post-Digestion Spike Sample Recovery	✓		
Duplicate	✓		
Laboratory Control Sample	✓		
Standard Addition Results	✓		
ICP Serial Dilutions	✓		
Instrument Detection Limits	✓		
ICP Interelement Correction Factors	✓		
ICP Linear Ranges	✓		
Preparation Log	✓		
Analysis Run Log	✓		
Raw Data			
ICP Raw Data	✓		
Furnace AA Raw Data	✓		
Mercury Raw Data	✓		
Cyanide Raw Data	✓		
Additional Data			
Internal laboratory chain-of-custody		✓	
Laboratory Sample Preparation Records	✓		

Data Package Item	Present?: Yes	No	N/A
Percent Solids Analysis Records	✓		
Reduction Formulae		✓	
Instrument Run Logs	✓		
Chemist Notebook Pages	✓		

2. HOLDING TIMES

Have all samples been analyzed within holding times? **Yes** No N/A

ACTION: If any holding times have been exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used? **Yes** No N/A

Are the correlation coefficients ≥0.995? **Yes** No N/A

Was a midrange cyanide standard distilled? **Yes** No N/A

ACTION: Qualify all data as unusable if reported from an analysis in which an instrument was not calibrated or was calibrated with less than the minimum number of standards. Qualify associated sample results >IDL as estimated (J) and results <IDL as estimated (UJ), if the correlation coefficient is <0.995 or the laboratory did not distill the midrange cyanide standard.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Are ICV and CCV percent recoveries within control? **Yes** No N/A

Are there calculation errors? Yes **No** N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

5. ICP INTERFERENCE CHECK SAMPLE

Has an ICS sample been analyzed at the proper frequency? **Yes** No N/A

Are the AB solution %R values within control? **Yes** No N/A

Are there calculation errors? Yes **No** N/A

ACTION: Qualify all affected data in accordance with Section 8.3 of the validation requirements. If calculation errors are noted, contact the laboratory for clarification.

6. LABORATORY BLANKS

Are target analytes present in the laboratory blanks? Yes No N/A

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U). If analyte concentrations in the blank are >CRDL or below the negative CRDL, verify the laboratory has redigested and reanalyzed associated samples with analyte concentrations <10 times the blank concentration. If the laboratory has not redigested and reanalyzed the samples, note in the validation narrative.

7. FIELD BLANKS

Are target analytes present in the field blanks? Yes No N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (U).

8. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the control limits? Yes No N/A

ACTION: Qualify the affected sample data according to the following requirements:

If spike recovery is >125% and sample results are <IDL no qualification is required. If spike recovery is >125% or <75% qualify all positive results as estimated (J). If spike recovery is 30% to 74% qualify all nondetects as estimated (UJ). If spike recovery is <30%, reject all nondetects (R). If the field blank has been used for spike analysis, note in the validation narrative.

9. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the sample data according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS result is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

10. PERFORMANCE AUDIT ANALYSES

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

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

11. DUPLICATE SAMPLE ANALYSIS

Are RPD values acceptable? Yes No N/A

ACTION: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD results fall outside the appropriate control limits. If field blanks were used for laboratory duplicates, note in the validation narrative.

12. ICP SERIAL DILUTION

Are the serial dilution results acceptable? Yes No N/A

Is there evidence of negative interference? Yes No N/A

ACTION: Qualify the associated data as estimated (J) for those analytes in which the %D is outside the control limits. If evidence of negative interference is found, use professional judgment to qualify the data.

13. FIELD DUPLICATE SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

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

14. FIELD SPLIT SAMPLES

Do the RPD values exceed the control limits? Yes No N/A

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

1516. FURNACE ATOMIC ABSORPTION QUALITY CONTROL

Do all applicable analyses have duplicate injections? Yes No N/A

Are applicable duplicate injection RSD values within control? Yes No N/A

If no, were samples rerun once as required? Yes No N/A

Does the RSD for the rerun fall within the control limits? Yes No N/A

Were analytical spike recoveries within the control limits? Yes No N/A

If no, were MSA analyses performed when required?	Yes	No	N/A
Are MSA correlation coefficients ≥0.995?	Yes	No	N/A
If no, was a second MSA analysis performed?	Yes	No	N/A

ACTION: If duplicate injections are outside the acceptance limits and the sample has not been reanalyzed or the reanalysis is outside the acceptance limits, qualify the associated data as estimated (J for detects and UJ for nondetects). If the analytical spike recovery is <40% qualify detects as estimated (J). If the analytical spike recovery is ≥10% but <40%, qualify all nondetects as estimated (UJ) and if the analytical spike recovery is <10%, reject all nondetects (R). If the sample absorbance is <50% of the analytical spike absorbance and the analytical spike recovery is <85% or >115%, qualify all results as estimated (J for detects and UJ for nondetects). If method of standard additions (MSA) was required but was not performed, the MSA samples were spiked incorrectly, or the MSA correllation coefficient was <0.995, qualify the associated detected results as estimated (J).

17. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly?	Yes	No	N/A
Are results within the calibrated range of the instruments and within the linear range of the ICP?	Yes	No	N/A
Are all detection limits below the CRQL?	Yes	No	N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

18. OVERALL ASSESSMENT AND SUMMARY

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

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

See attached for deficiencies

[illegible]
5/12/92

9613402.1463

SEP 1991
RECEIVED
DATA RECEIPT

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

DATE RECEIVED: 07/10/91 RFW LOT # :9107L114

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	Days
BOOX59							
SILVER, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	28
SILVER, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
SILVER, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
ALUMINUM, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
ALUMINUM, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
ALUMINUM, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
ARSENIC, TOTAL	001	S	91L1322	07/08/91	07/12/91	07/16/91	8
ARSENIC, TOTAL	001 REP	S	91L1322	07/08/91	07/12/91	07/16/91	
ARSENIC, TOTAL	001 MS	S	91L1322	07/08/91	07/12/91	07/16/91	
BARIUM, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	28
BARIUM, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
BARIUM, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
BERYLLIUM, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
BERYLLIUM, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
BERYLLIUM, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
BISMUTH, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/01/91	24
BISMUTH, TOTAL REP	001 REP	S	91L1323	07/08/91	07/12/91	08/01/91	
BISMUTH, TOTAL DUP S	001 MSD	S	91L1323	07/08/91	07/12/91	08/01/91	
CALCIUM, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	28
CALCIUM, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
CALCIUM, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
CADMIUM, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
CADMIUM, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
CADMIUM, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
COBALT, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
COBALT, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
COBALT, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
CHROMIUM, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
CHROMIUM, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
CHROMIUM, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
COPPER, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
COPPER, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
COPPER, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
IRON, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
IRON, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
IRON, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
MERCURY, TOTAL	001	S	91C223B	07/08/91	07/29/91	07/30/91	22

No qualification
Required
Holding
Time met

MA
5/12/92

9613402.1464

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

DATE RECEIVED: 07/10/91 RFW LOT # :9107L114

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	Days
MERCURY, TOTAL	001 REP	S	91C223B	07/08/91	07/29/91	07/30/91	22
MERCURY, TOTAL	001 MS	S	91C223B	07/08/91	07/29/91	07/30/91	
POTASSIUM, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	28
POTASSIUM, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
POTASSIUM, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
MAGNESIUM, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
MAGNESIUM, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
MAGNESIUM, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
MANGANESE, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
MANGANESE, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
MANGANESE, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
SODIUM, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
SODIUM, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
SODIUM, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
NICKEL, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
NICKEL, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
NICKEL, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
LEAD, TOTAL	001	S	91L1322	07/08/91	07/12/91	07/16/91	8
LEAD, TOTAL	001 REP	S	91L1322	07/08/91	07/12/91	07/16/91	
LEAD, TOTAL	001 MS	S	91L1322	07/08/91	07/12/91	07/16/91	
ANTIMONY, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	28
ANTIMONY, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
ANTIMONY, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
SELENIUM, TOTAL	001	S	91L1322	07/08/91	07/12/91	07/16/91	8
SELENIUM, TOTAL	001 REP	S	91L1322	07/08/91	07/12/91	07/16/91	
SELENIUM, TOTAL	001 MS	S	91L1322	07/08/91	07/12/91	07/16/91	
THALLIUM, TOTAL	001	S	91L1322	07/08/91	07/12/91	07/15/91	7
THALLIUM, TOTAL	001 REP	S	91L1322	07/08/91	07/12/91	07/15/91	
THALLIUM, TOTAL	001 MS	S	91L1322	07/08/91	07/12/91	07/15/91	
VANADIUM, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	28
VANADIUM, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
VANADIUM, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	
ZINC, TOTAL	001	S	91L1323	07/08/91	07/12/91	08/05/91	
ZINC, TOTAL	001 REP	S	91L1323	07/08/91	07/12/91	08/05/91	
ZINC, TOTAL	001 MS	S	91L1323	07/08/91	07/12/91	08/05/91	

LAB QC:

No qualification required
Holding times met
[illegible] 5/12/92

SILVER LABORATORY	LC1 BS	S	91L1323	N/A	07/12/91	08/05/91
ALUMINUM LABORTORY	LC1 BS	S	91L1323	N/A	07/12/91	08/05/91

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3
BLANKS

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

Lab code: WESTON Case No.: 200BP SAS No.: SDG No.: CLP114

Preparation Blank Matrix (soil/water): SOIL

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

Analyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
Aluminum	84.0	U	84.0	U	84.0	U	84.0	U	16.800	U	P
Antimony	18.0	U	18.0	U	18.0	U	18.0	U	3.600	U	P
Arsenic	2.0	U	2.0	U	2.0	U	2.0	U	.400	U	F
Barium	5.1	B	5.0	U	6.5	B	5.1	B	1.000	U	P
Beryllium	1.0	B	1.0	B	1.0	B	1.0	U	.200	B	P
Cadmium	2.0	U	2.0	U	2.0	U	2.0	U	.400	U	P
Calcium	91.0	U	91.0	U	91.0	U	91.0	U	18.200	U	P
Chromium	3.0	U	3.0	U	3.0	U	3.0	U	.600	U	P
Cobalt	3.0	U	3.0	U	3.0	U	3.0	U	.600	U	P
Copper	8.4	B	8.0	B	11.7	B	10.3	B	.400	U	P
Iron	36.0	U	36.0	U	36.0	U	36.9	B	7.200	U	P
Lead	2.0	U	2.0	U	2.0	U			.400	U	F
Magnesium	76.0	U	76.0	U	76.0	U	76.0	U	15.200	U	P
Manganese	1.0	U	1.0	U	1.7	B	1.0	U	.200	U	P
Mercury	.2	U	.2	U	.2	U	.2	U	.100	U	CV
Nickel	11.1	B	9.3	B	12.0	B	13.3	B	1.200	U	P
Potassium	955.0	U	955.0	U	955.0	U	955.0	U	191.000	U	P
Selenium	2.0	U	2.0	U	2.0	U	2.0	U	.400	U	F
Silver	4.0	U	4.0	U	4.0	U	4.0	U	.800	U	P
Sodium	48.0	U	48.0	U	48.0	U	48.0	U	9.600	U	P
Thallium	2.0	U	2.0	U	2.0	U	2.0	U	.400	U	F
Vanadium	4.0	U	4.0	U	4.0	U	4.0	U	.820	B	P
Zinc	15.6	B	16.0	B	16.3	B	16.3	B	.400	U	P
Cyanide	10.0	U	10.0	U	10.0	U			.500	U	C

All associated sample concentrations >5X adjusted blank conc.
5/12/92

FORM III - IN 03/90

9613402.1466

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

BOOX59S

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

Lab Code: WESTON Case No.: 200BP SAS No.: SDG No.: CLP114

Matrix: SOIL Level (low/med): LOW

% Solids for Sample: 96.8

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

Analyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
Aluminum									NR
Antimony	75-125	79.5739		2.6949	U	94.78	84.0		P
Arsenic	75-125	6.9148		1.6053		8.26	64.3	N	F
Barium	75-125	392.1829		23.0866	B	379.10	97.4		P
Beryllium	75-125	8.9108		.4524	B	9.48	89.2		P
Cadmium	75-125	8.4389		.2994	U	9.48	89.0		P
Calcium									NR
Chromium	75-125	33.7971		.4492	B	37.91	88.0		P
Cobalt	75-125	88.8809		3.1516	B	94.78	90.5		P
Copper	75-125	48.0704		11.7664		47.39	76.6		P
Iron									NR
Lead	75-125	5.5152		3.1869		4.13	56.4	N	F
Magnesium									NR
Manganese	75-125	254.1891		131.9320		94.78	129.0	N	P
Mercury	75-125	.5440		.1033	U	.52	104.6		CV
Nickel	75-125	91.8948		5.8495	B	94.78	90.8		P
Potassium									NR
Selenium	75-125	1.1497		.2973	U	2.07	55.5	N	P
Silver	75-125	3.6413		.7369	B	9.48	30.6	N	B
Sodium									NR
Thallium	75-125	6.7815		.2973	U	10.33	65.6	N	P
Vanadium	75-125	96.6715		7.6925		94.78	93.9		P
Zinc	75-125	99.4579		14.0092		94.78	90.2		P
Cyanide									NR

Comments:

Circled analytes outside QC limits of 75-125%
Results qualified as estimated (J or UJ)

FORM V (Part 1) - IN 03/90

Zat
5/12/92

9613402.1467

U.S. EPA - CLP

14
ANALYSIS RUN LOG

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

Lab Code: WESTON Case No.: 200BP SAS No.: SDG No.: CLP114

Instrument ID Number: AA3 Method: F

Start Date: 7/16/91 End Date: 7/16/91

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.00	2024		-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
S3	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
S15	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
S30	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
S60	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
ICV1	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
ICB1	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CRA	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CCV1	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CCB1	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
ZZZZZZ	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZZZZZ	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PBS122	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
PBS122A	1.00		102.0	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
LCSS122	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
LCSS122A	1.00		81.5	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
LCSS222	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
LCSS222A	1.00		83.0	-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
BOOX59	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BOOX59A	1.00		80.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCV2	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CCB2	1.00	2155		-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

FORM XIV - IN 03/90

MAT 5/12/92 MSA rcvd MAT 5/12/92

9613402.1468

U.S. EPA - CLP

14
ANALYSIS RUN LOG

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

Lab Code: WESTON Case No.: 200BP SAS No.: SDG No.: CLP114

Instrument ID Number: AA3 Method: F

Start Date: 7/16/91 End Date: 7/17/91

EPA Sample No.	D/F	Time	% R	Analytes																							
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.00	2223		-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
S3	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
S15	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
S30	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
S60	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
ICV1	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
ICB1	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CRA	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CCV1	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CCB1	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
BOOX59D	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BOOX59DA	1.00		78.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BOOX59S	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
ZZZZZZ	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCV2	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CCB2	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
ZZZZZZ	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZZZZZZ	1.00			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CCV3	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CCB3	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CCV4	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CCB4	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
BOOX590	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
BOOX591	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
BOOX592	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
BOOX593	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
BOOX59D0	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
BOOX59D1	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
BOOX59D2	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
BOOX59D3	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CCV5	1.00			-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-
CCB5	1.00	39		-	-	-	-	-	-	-	-	-	-	-	X	-	-	-	-	-	-	-	-	-	-	-	-

FORM XIV - IN 03/90

5/12/92

9613402.1469

U.S. EPA - CLP

14
ANALYSIS RUN LOG

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

Lab Code: WESTON Case No.: 200BP SAS No.: SDG No.: CLP114

Instrument ID Number: AA1 Method: F

Start Date: 7/16/91 End Date: 7/17/91

EPA Sample No.	D/F	Time	% R	Analytes																								
				AL	SB	AS	BA	BE	CD	CA	CR	CO	CU	FE	PB	MG	MN	HG	NI	K	SE	AG	NA	TL	V	ZN	CN
S0	1.00	2201																			X						
S5	1.00																				X						
S15	1.00																				X						
S30	1.00																				X						
S60	1.00																				X						
ICV1	1.00																				X						
ICB1	1.00																				X						
CRA	1.00																				X						
CCV1	1.00																				X						
CCB1	1.00																				X						
ZZZZZZ	1.00																										
ZZZZZZ	1.00																										
ZZZZZZ	1.00																										
ZZZZZZ	1.00																										
ZZZZZZ	1.00																										
ZZZZZZ	1.00																										
ZZZZZZ	1.00																										
ZZZZZZ	1.00																										
ZZZZZZ	1.00																										
ZZZZZZ	1.00																										
CCV2	1.00																				X						
CCB2	1.00																				X						
ZZZZZZ	1.00																										
ZZZZZZ	1.00																										
PBS122	1.00																				X						
PBS122A	1.00		93.0																		X						
LCSS122	1.00																				X						
LCSS122A	1.00		96.0																		X						
LCSS222	1.00																				X						
LCSS222A	1.00		103.0																		X						
BOOX59	1.00																				X						
BOOX59A	1.00		84.0																		X						

FORM XIV - IN 03/90

MR 5/12/91 Outside 85-115% limits
Sample abs. < 50% Spike ABS
Qualify as UJ

WET CHEMISTRY DATA VALIDATION CHECKLIST - FORM A-7

PROJECT: 200 BP 1	REVIEWER: KWA	DATE: 5/12/92
LABORATORY: Weston	CASE: —	SDG: 9107L114
SAMPLES/MATRIX:		
B00X59		

1. DATA PACKAGE COMPLETENESS

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

Data Package Item	Present?: Yes	No	N/A
Case Narrative	✓	—	—
Cover Page	✓	—	—
Traffic Reports/Chain-of-Custody	✓	—	—
Sample Analysis Data Report Forms	✓	—	—
Standards Data	✓	—	—
QC Summary			
Blanks Summary Report Forms	✓	—	—
Spike Sample Recovery Report Forms	✓	—	—
Duplicate Sample Analysis Report Forms	✓	—	—
Laboratory Control Sample Report Forms	✓	—	—
Raw Data			
Ion Chromatograph Chromatograms	✓	—	—
TOC and TOX Instrument Printouts	—	✓	—
Laboratory Bench Sheets	✓	—	—
Additional Data			
Laboratory Sample Preparation Logs	✓	—	—
Instrument Run Logs	✓	—	—
Internal Laboratory Chain-of-Custory	—	✓	—
Percent Solids Analysis Records	✓	—	—
Reduction Formulae	—	✓	—
Chemist Notebook Pages	✓	—	—

2. HOLDING TIMES

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

Action: If any holding times were exceeded qualify all affected results as estimated (J for detects and UJ for nondetects).

3. INITIAL CALIBRATIONS

Were all instruments calibrated daily, each set-up time and were the proper number of standards used?	Yes	No	N/A
Are the correlation coefficients ≥0.995?	Yes	No	N/A
Was a balance check conducted prior to the TDS analysis?	Yes	No	N/A
Was the titrant normality checked?	Yes	No	N/A

ACTION: Qualify all data as unusable (R) if reported from an analysis in which the above criteria were not met.

4. INITIAL AND CONTINUING CALIBRATION VERIFICATION

Have ICV and CCV been analyzed at the proper frequency? IC	Yes	No	N/A
Are ICV and CCV percent recoveries within control?	Yes	No	N/A
Are there calculation errors?	Yes	No	N/A

ACTION: Qualify all affected data in accordance with the validation requirements.

5. LABORATORY BLANKS

Are target analytes present in the laboratory blanks?	Yes	No	N/A

ACTION: Qualify all associated sample results for any analyte <5 times the amount in any laboratory blank as nondetected (U) and list the affected samples and analytes below.

6. FIELD BLANKS

Are target analytes present in the field blanks?	Yes	No	N/A

ACTION: Qualify all sample results for any analyte <5 times the amount in any valid field blank as nondetected (U).

7. MATRIX SPIKE SAMPLE ANALYSIS

Are spike recoveries within the acceptance limits? not analyzed	Yes	No	N/A

ACTION: If the sample concentration exceeds the spike concentration by a factor of 4 or more, and spike recoveries are outside the acceptance limits, no qualification is necessary. If spike recovery is outside the control limits and the sample results are >CRQL, qualify the data as estimated (J). If the spike recovery is <30% and the sample results are less then the IDL qualify the data as unusable (R).

8. LABORATORY CONTROL SAMPLE

Are percent recoveries within the acceptance limits? Yes No N/A

Are there calculation errors? Yes No N/A

ACTION: Qualify the affected results according to the following requirements:

AQUEOUS LCS - Qualify as estimated (J), all sample results >IDL, for which the LCS %R falls within the range 50-79% or >120%. Qualify as estimated (UJ), all sample results <IDL, for which the LCS falls within the range of 50-79%. Qualify as unusable (R) all sample results, for which the LCS %R <50%.

SOLID LCS - Qualify as estimated (J), all sample results >IDL for which the LCS %R is outside the established control limits. Qualify as estimated (UJ), all sample results <IDL for which the LCS %R are lower than the established control limits.

9. PERFORMANCE AUDIT ANALYSES

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

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

10. DUPLICATE SAMPLE ANALYSIS

Are RPD values within the acceptance limits? for CN only Yes No N/A

Action: Qualify the results for all associated samples of the same matrix as estimated (J) if the RPD falls outside the acceptance limits.

11. FIELD DUPLICATE SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

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

12. FIELD SPLIT SAMPLES

Do RPD values exceed the acceptance limits? Yes No N/A

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

13. ANALYTE QUANTITATION AND DETECTION LIMITS

Have results been reported and calculated correctly? Yes No N/A

Are instrument detection limits below the CRDL? Yes No N/A

Action: If analyte quantitation is in error, contact the laboratory for explanation. If errors or deficiencies can not be resolved with the laboratory, qualify associated data as unusable (R).

14. OVERALL ASSESSMENT AND SUMMARY

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

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

ACTION: Summarize all the data qualifications and complete the data validation narrative as specified in Section 10.0 of the data validation requirements.

COMMENTS (attach additional sheets as necessary):

See attached for deficiencies
[illegible]
5/12/92

9613402.1475

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

DATE RECEIVED: 07/10/91 RFW LOT # :9107L114

CLIENT ID /ANALYSIS	RFW #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS	Days
BOOX59							
% SOLIDS	001	S	91L%S127	07/08/91	07/16/91	07/17/91	9
NITRITE BY IC	001	S	91LIC110	07/08/91	07/24/91	07/24/91	16
NITRATE BY IC	001	S	91LIC110	07/08/91	07/24/91	07/24/91	16
TOTAL CYANIDE	001	S	91LC235	07/08/91	07/19/91	07/19/91	11
TOTAL ORGANIC CARBON	001	S	91LOM033	07/08/91	07/22/91	07/23/91	15
TOTAL ORGANIC CARBON	001 REP	S	91LOM033	07/08/91	07/22/91	07/23/91	15
SUB-OUT TEST FOR SUB	001	S		07/08/91			

Nitrite/nitrate exceed 48 h holding time, all results estimated (J or UJ) [illegible] 5/24/92

LAB QC:

FLUORIDE BY IC	MB1	S	91LIC110	N/A	07/24/91	07/24/91
FLUORIDE BY IC	MB1 BS	S	91LIC110	N/A	07/24/91	07/24/91
NITRITE BY IC	MB1	S	91LIC110	N/A	07/24/91	07/24/91
NITRITE BY IC	MB1 BS	S	91LIC110	N/A	07/24/91	07/24/91
NITRATE BY IC	MB1	S	91LIC110	N/A	07/24/91	07/24/91
NITRATE BY IC	MB1 BS	S	91LIC110	N/A	07/24/91	07/24/91
SULFATE BY IC	MB1	S	91LIC110	N/A	07/24/91	07/24/91
SULFATE BY IC	MB1 BS	S	91LIC110	N/A	07/24/91	07/24/91
TOTAL CYANIDE	LC1 L	S	91LC235	N/A	07/19/91	07/19/91
TOTAL CYANIDE	LC2 L	S	91LC235	N/A	07/19/91	07/19/91
TOTAL CYANIDE	MB1	S	91LC235	N/A	07/19/91	07/19/91